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I. CONTRIBUTIONS

ANCIENT EGYPT, A CENTRE OF AGRICULTURE *

From time immemorial Egypt has been known as a rich farming country, abounding in wheat, flax and other agricultural produce. Biblical and other traditions of antiquity describe the soil of the Nile Valley as singularly fertile, and the Egyptians themselves as primarily hard working farmers. One of the ancient Hebrew writers mentions the "Land of Egypt", and the mythical paradisaical "gardens of Yahweh" as the most flowering of all lands [1]. The Odyssey contains a very colourful description of the attack of the Achaeans on the "splendid fields of the Egyptians" [2]. We learn a good deal about Egyptian agriculture from Herodotus, Diodorus, Theophrastus and other ancient Greek writers. Later on, the Romans began to praise the agricultural produce of Egypt. For instance, Tacitus considered Egypt the "granary of Italy" [3]. Still later, in the IInd century, Lucian of Samosata, the "Voltaire of Antiquity", in his inimitably pointed comparison of the various nations of his time, spoke of the Egyptians as a farming people. The hero of one of his stories, Icaromenippus, viewing the world from the height of a bird's flight, sees the Getae fighting, the Scythians roaming, the Phoenicians travelling, the Cilicians plundering, the Athenians engaging in lawsuits, but the Egyptians, of course, are tilling the soil [4]. Hence, many ancient peoples looked with envy on the fruitful valley of the Nile, and its agricultural resources were held in high repute. However, this was still a far cry from acknowledging Egypt the most ancient agricultural country.

* Recommended by Prof. A. A. Zvorikine, Vice-President of the International Commission.

[1] Genesis, XIII, 10. The text in point was written by a Yahwist and hence refers to the IXth century B.C.

[2] Odyssey, XIV, 263.

[3] Tacitus, Annals, II, 59.

[4] Lucian, Icaromenippus, 16.

Every farming people made some claim to the title of the most ancient tillers of the soil. Each has its myths of gods and heroes, its inventors of farming. The Egyptians had their God Osiris ; the Sumerians their God Ea or hero Emesh ; the ancient Hebrews their forefather Cain ; the ancient Chinese King Shen-Mung ; the Athenians, the semi-god Triptolemus, and so on.

I

It has always been accepted as a matter of course that farming appeared in one place and subsequently spread to other lands [5]. Most modern researchers, whether historians, archaeologists or botanists, try to prove a most ancient seat of farming, if not of the world as the ancient writers did, then at least of broad geographical regions. Most frequently the origin of agriculture has been sought for in Asia. A highly illuminating and finished form of the theory of the Asiatic origin of cultivated plants was given by the German historian and linguist V. Hehn, author of the important work entitled "Cultivated Plants and Domestic Animals and their Migration from Asia to Greece and Italy, and also throughout the Rest of Europe" [6]. The very title reveals clearly the author's basic premises. It is understandable that this point of view was particularly acceptable to Assyriologists, who tried to find in Western Asia the source of Egyptian and European civilization. The prominent Czechoslovakian authority B. Grozny presumes that the forbears of the Indo-European, Semitic and Hamitic peoples at one time had lived on the shores of the Caspian Sea and only later in successive waves of migration had they settled in the East, West and South [7]. It is, therefore, understandable that the author tries to find traits of similarity rather than difference in the agricultures of the Asiatic countries and of Egypt [8]. It is indicative that even a number of outstanding Egyptologists, who cannot be suspected of trying to minimize the role of Egyptian culture, agree that agriculture originated in Asia and was brought to Egypt only afterwards. Such were the views of G. Maspero in France, A. Erman in Germany and B. A. Turaev in Russia [9].

[5] See for example : Sophocles, Triptolemus, excerpts VIII and IX (Nos. 545-546).

[6] Victor Hehn, *Culturpflanzen und Haustiere in ihrem Übergang aus Asien nach Griechenland und Italien, sowie in das übrige Europa*, 4. Aufl., Berlin, 1888.

[7] B. Grozny, "Prehistoric Destinies of Western Asia", *Vestnik drevnye istorii*, 1940, No. 3-4, pp. 24-25.

[8] Friedrich Hrozny (after 1918 see B. Grozny), *Das Getreide im alten Babylonien*, Wien, 1913 (*Sitzungsberichte der K. Akad. der Wissenschaften in Wien*, s. 40).

[9] G. Maspero, *Histoire ancienne des peuples de l'Orient classique*, Paris, 1895, I, p. 27 ; A. Erman und H. Ranke, *Ägypten und ägyptisches Leben im Altertum*, Tübingen, 1923, s. 35 ; B. A. Turaev, *Ancient Egypt* (in Russian), Petrograd, 1922, p. 7.

On the question which of the Asiatic countries played a decisive role in the history of agriculture, opinion is divided. Very widespread (especially among British Orientalists) is the Palestinian theory. H. Hall considers that not only wheat and grapes, but even the cult of Osiris, the God of farming, was brought to Egypt from Syria and Palestine [10]. On the basis of archaeological data, particularly the flint sickles found on mesolithic camping sites in Palestine, Harold Peake considers that country the most ancient centre of agriculture,[11] whence it subsequently spread to Egypt and other African countries. This theory seems erroneous to me.

If agriculture was really borrowed by the Egyptians from the most ancient (pre-semitic) inhabitants of Palestine, then we would undoubtedly have found the same kind of agricultural crops in both countries. From the earliest times right down to the Hellenistic period the principal cereal in Egypt was emmer (two-granular, Tr. dicoccum / schrank / the Greek olyra). This cereal differs from ordinary wheat (Tr. vulgare, as well as from Tr. turgidum), in that in threshing, the grains do not fall out of the husks. Therefore, before the threshed grain can be put through the mill it is first necessary to pound it in a mortar. In quality the bread baked of emmer flour is inferior to wheat bread (it gets stale quickly). But then gruel made of emmer is distinguished for its tastiness [12]. According to Herodotus, emmer was the only cereal used by the inhabitants of Lower Egypt as a food [13]. Of course this is an exaggeration. Egyptian texts mention also barley bread, which was used mainly by the poor and slaves. Wheat was also cultivated, though not extensively. However (from about 5000 B.C. down to the time of the Ptolemies) emmer always held the first place, especially in Lower Egypt. This is confirmed by written sources and archaeological finds.

We find an entirely different picture in Palestine. True, emmer was known here also, but it was planted and used as a food very rarely. The Bible mentions emmer only three times : twice when speaking of Egyptian and Mesopotamian grain and only in the third instance of Palestinian [14]. Of course, one may suppose (as does B. Grozny) that in pre-Israelite Palestine emmer was of greater importance, but was later supplanted by the more valuable wheat [15]. This, however, is refuted by Egyptian documents and archaeological data. The annals of Thutmosis III repeatedly mention the seizure of grain in Rethenu

[10] *The Cambridge Ancient History*, edited by Y. B. Bury, S. A. Cook, F. E. Alcock, Cambridge, 1928, I, p. 264.
[11] *Soviet Ethnography*, No. 6-7, 1947, p. 338.
[12] Klingen, *Among the Patriarchs of Agriculture* (in Russian), I, St. Petersburg, 1898, p. 310.
[13] Herodotus, II, 36.
[14] Exodus, IX, 32 ; Ezikiel, IV, 9.
[15] F. Hrozny, *op. cit.*, s. 35.

(Palestine) and Djahi (Phoenicia), but emmer is referred to only once, and then after barley and wheat [16]. During excavations in Palestine, not a single grain of emmer has been found to the present day. But barley and wheat (Tr. turgidum) [17] have been found. It follows from this that the varieties of cereals cultivated in Egypt differed from those in Palestine. In Egypt emmer was at the top of the list, and wheat at the bottom. In Palestine emmer was inconsequential in all periods. This of itself speaks against the theory that agriculture came to Egypt from Palestine.

Comparative philology also testifies against the "Palestinian" theory. The ancient Hebrew name for emmer—*ksmt*—has nothing in common with the Egyptian *bd.t.* The names for barley and wheat are likewise entirely different in both languages. The main argument of H. Peake, the existence of mesolithic sickles in Palestine and their absence in Egypt, cannot be considered indisputable either. In the first place these sickles may have been used for reaping wild cereals and the discovery of them does not prove the existence of agriculture in the Natufian settlements. This possibility is foreseen by B. Grozny [18]. Secondly, mesolithic documents have not as yet been found in Egypt. It is not impossible that they are buried in the sand that covers the outskirts of the Nile Valley. For the time being we can say that we do not know of mesolithic sickles in Egypt, but that does not imply that they did not exist there. Even if it should turn out that the sickles appeared in Palestine several centuries earlier than in Egypt, that does not necessarily indicate that the Egyptians borrowed them from their Asiatic neighbours. The contacts of Egypt and Palestine about 5000 B.C. were of such a chance nature that the supposition of systematic exchange of work implements and economic techniques between their inhabitants cannot be considered. The ethnic composition of the populations and cultures of Egypt and Palestine of that time were extremely different.

Adherents of the Palestinian theory of the origin of agriculture refer to the fact that wild emmer is still to be found in Palestine today, whereas in Egypt it is non-existent. But this argument, too, arouses many doubts. Soviet botany [19] has established that the wild Palestinian emmer differs greatly from cultivated emmer and is not its forerunner, but a parallel sort (possibly a formerly cultivated cereal that has since run wild). Egypt may have had its wild forerunners of emmer and other cereals, but they disappeared early due to local natural conditions

[16] K. Sethe, *Urkunden der XVIII. Dynastie*, IV, 694 (IV, 662 ; IV, 687-88 ; IV, 787 and other places where emmer is non-existent).
[17] F. Hrozny, *op. cit.*, s. 26-28.
[18] B. Grozny, *op. cit.*, p. 25.
[19] N. I. Vavilov, *Centres of the Origin of Cultivated Plants* (Works on Applied Botany, Genetics and Selection, v. XVI, London, 1926, pp. 23-24).

(drying up of the soil outside the irrigated zone). Hence there is not a single unassailable proof of the Palestinian origin of Egyptian crops.

The possibility remains that agriculture may have penetrated to Egypt from the south, from the districts of equatorial Africa. This proposition was advanced and supported by the Soviet botanists Academicians N. I. Vavilov and K. Flaxberger. Their reasoning amounts in the main to two arguments. The first is based on the many varieties of emmer existing in Ethiopia (Abyssinia) ; the second, on the extraordinary similarity of excavated samples of Egyptian emmer relating to the time of the XIIth dynasty (XX-XVIIIth B.C.) with the present Ethiopian subspecies [20]. These two observations made by prominent experts in the field of botany are undoubtedly valuable and indisputable, and historians of the ancient world should take them into account. Nevertheless, they do not decide the question of the priority of one or another agricultural country. The number of varieties of emmer in ancient Egypt may have been no less than in Ethiopia (Abyssinia), but many of them might have disappeared as being less productive, and not all of those that survived have reached us. As regards the similarity between the ancient-Egyptian samples and the Ethiopian (Abyssinian), it does not mean that the latter are forerunners of the former.

In order to solve the problem under consideration, it is necessary to compare the observations of botanists with the evidence of historical sources and the results of archaeological investigations. Both sorts of findings attest to the absence of all direct contact between ancient Egypt and Ethiopia (Abyssinia) right down to the Hellenistic period. Flaxberger, however, basing himself on Herodotus, tries to show that there had been dealings between the two countries in ancient times. "That there were connections between the ancient Egyptians and Abyssinia", he writes, "was pointed out by Herodotus (about 485-425 B.C.), who in book two of his 'History' shows that only the Colchians, Egyptians and Ethiopians from most ancient times adhered to the ritual of circumcision whereas the Phoenicians and the Palestinian Syrians took this ritual over from the Egyptians. Further he also points out (II, 110) that Sesostris (Ramses II) was the only Egyptian who ruled over Ethiopia" [21]. It is clear from these lines that K. Flaxberger without any hesitation identifies ancient Ethiopia with modern Ethiopia (Abyssinia). Actually the "father of history" applied this term to the territory corresponding approximately to that of the present-day state of Sudan but had no idea of the basin of the Blue Nile. The geographical terms Ethiops and Ethiopia were used loosely (similar to the names "Saxony"

[20] K. Flaxberger, *Ancient Egyptian and Modern Emmers* (Works on Applied Botany, Genetics and Selection, III, XIX, London, 1928, p. 505 and subsequent).
[21] *Ibid.*, p. 504.

and "Burgundy" in documents of the Middle Ages). Authors of antiquity apply the name Ethiopian to the land that stretches from the south of Egypt, primarily the districts of the Nile rapids. Later, as geographical horizons broadened, this name came to be applied to the territory further south, to what is known today as Ethiopia. But in ancient times the situation was different. Ancient Egyptian writings, like Herodotus's "History", contain no allusions to the region south of the confluence of the White and the Blue Nile.

It is true that the ancient Egyptians were well acquainted with the country known as Punt, corresponding approximately to modern Eritrea and French and British Somaliland. Beginning from the time of the Ancient Kingdom Egyptian seamen sailed to this country and entered into economic and cultural contacts with its inhabitants. But there are no references in Egyptian texts to the existence of agriculture in this district. It is indicative that among the gifts received by the Egyptian Queen Hatshepsut (1525-1503 B.C.) from Punt we find myrrh resin, green myrrh saplings, ebony, gold, incense, monkeys, dogs, leopard skins and, finally, slaves, but not a word about agricultural produce. On the contrary, the Egyptian seamen who came to the shores of the Bab el Mandeb Strait brought bread, beer, wine and fruit for the inhabitants of Punt [22]. In the Greek and Roman epoch Egyptian bread made its way to Punt (which the Greeks called Barbary) not as a treat but as a commodity. A thorough account of this is given by the anonymous author of "Voyages Around the Eritrean Sea", whom later tradition confused with Arrian. In a businesslike tone this author gives us exact and detailed information to the effect that Egyptian grain was one of the basic goods transported from Egypt to Barbary. Wheat and rice, sesame oil, sugar cane, etc., were also brought here from India [23].

If agriculture really arose in Ethiopia (Abyssinia) earlier than in Egypt, then it would hardly have been necessary for agricultural produce to be brought to a neighbouring maritime zone from such comparatively distant countries as Egypt and India. In any case all the original sources at our command speak of wheat being brought not from the shores of Bab el Mandeb Strait but, on the contrary, to this region. Of course there is another possibility. We may suppose that in continental Ethiopia (Abyssinia), somewhere in the region of Lake Tana, an agricultural centre arose early, but for some reason wheat was carried from here not to the shores of the sea, but northward, along the valley of the Upper Nile to Egypt. But if we accept such a hypothesis, then it will be quite incomprehensible why agriculture developed so slowly in Nubia. The latest excavations in the district of

[22] K. Sethe, *op. cit.*, p. 420.
[23] Pseudoappian, *A Voyage Around the Eritrean Sea*, 7-13, 17, 24.

Khartoum, that is, in the region lying on the direct route from Egypt to Ethiopia (Abyssinia) yielded abundant ceramic materials which closely resemble Egyptian articles of the aëneolithic period. A. Y. Arkell and other British archaeologists consider it even possible to speak of the influence of South-Nubian ceramics on Egypt. At the same time in the layers where the ceramics were found, there were neither sickles nor any other signs of agriculture. Judging by the remains of food that have been preserved, the population of southern Nubia in the period corresponding to archaic Egypt lived on fishing and hunting of buffaloes, antelopes, hippopotami and water fowl [24]. Hence, in the period when Egypt had already become an agricultural country, agriculture was not yet known in the junction of Nubia (Sudan) and Ethiopia (Abyssinia), and to talk of its spreading from the south to the north along the course of the Nile is absolutely out of the question. As for North Nubia, according to archaeological data, the population practised agriculture back in the 4th millennium B.C., nevertheless hunting and cattlebreeding predominated [25]. Even in the 3rd millennium B.C. tilling of the soil was obviously practised in North Nubia on a very limited scale. Egyptian texts of the time of the Ancient Kingdom attest to this very definitely. In the detailed descriptions of the rich booty seized in Nubia by Egyptian troops we do not find any mention of agricultural produce. For example, nomarch Huefhor (the name was formerly pronounced Hehrhuf) of Elephantine in his account of his campaign in Nubia stated that he loaded 300 asses with incense, ebony wood, perfume, leopard skins, ivory, etc. In this enumeration there is only one item indicated by the word *sat* which B. A. Turaev interpreted as some kind of grain [26]. This hypothesis, however, has not been confirmed to this day. The large Berlin dictionary translates the puzzling word *sat*, which is met with only once in Egyptian writings—in the text under consideration—only approximately as "product of Nubia",[27] and such caution on the part of the compilers deserves approval. "Sat" might mean some kind of wild fruits, perhaps not even edible, and possibly used for some other purpose. We have no data on which to base the supposition that this is a cultivated plant.

Thus, if it is at all permissible to speak of the connection between Nubian and Egyptian agriculture, then only in the sense that the Egyptians influenced the Nubians and not the other way round. If we compare the cultivated plants of both countries, it becomes immediately

[24] A. Y. Arkell, *Early Khartoum*, Oxford, 1949, pp. 27 and 111.

[25] G. Röder, "Die geschichte Nubiens und des Sudan", *Klio*, Bd. XII, 1912, p. 59; I. S. Katznelson, "Problems of Historical Development of Ancient Nubia", *Vestnik drevnye istorii*, 1948, No 2, p. 184.

[26] B. A. Turaev, *Story by the Egyptian Sinuhe and examples of Egyptian documental autobiography*, Moscou, 1915, p. 52.

[27] A. Erman und H. Grapow, *Das Wörterbuch der aegyptischen Sprache*, IV, s. 14.

evident that emmer, so typical of ancient Egypt (as well as of present-day Ethiopia), was non-existent in ancient Nubia. Authors of antiquity —Strabo and Pliny—point out that only barley and millet were planted in Ethiopia [28]. True, these statements refer to the Ist century B.C. and the Ist century A.D., but it could hardly be supposed that emmer was cultivated earlier in Nubia and then disappeared entirely. Besides the Egyptian texts contain no references to the cultivation of any kinds of wheat in Nubia. Hence, if we presume, with Vavilov and Flaxberger, that emmer had been cultivated in archaic times in Ethiopia (Abyssinia) and from there penetrated to Egypt, then we would be admitting something quite incomprehensible. It would be necessary to suppose that emmer seeds had been obtained through Nubia (modern Sudan), but the Nubian tribes themselves, who were middlemen in transferring these seeds, never used such valuable cultivated plants. In deciding this question another circumstance has to be taken into account. If agriculture arose on lands located south of Egypt sooner than in that country itself, then the social relations of the ancient inhabitants of Ethiopia and the Sudan would have been more developed. We know very well that Egypt had a class society, a state and a writing system much earlier than, for example, Axum. This alone is sufficient ground to consider that great advances in economy connected with the transition from hunting to agriculture took place in the basin of the lower Nile earlier than in the region of its source. All data speak in favour of the fact that agriculture arose in Egypt independently and was not brought by settlers from other countries or acquired by the Egyptians from their neighbours.

All this, however, does not prove that Egypt was the most ancient centre of agriculture, its cradle, as the British scientist V.J. Perry holds [29].

The fact that agriculture developed in different countries in different ways and each region created its own varieties of cultivated plants, speaks in favour of the proposition that the earliest agricultural centres arose simultaneously or nearly so. The chronology of the neolithic period is still insufficiently exact to allow of drawing a final conclusion on the priority of one or another country. Moreover, this is not a matter of principle. Whether agriculture originated in Egypt several hundred years earlier than in Palestine, or Mesopotamia, or Central Asia or Asia Minor, or whether it was just the contrary, should be elucidated, but this is not of prime importance. The important fact is that agriculture arose in every one of the enumerated regions very early (approximately in the 5th millennium B.C.) and entirely independently. Egypt is, therefore, to be regarded as one of the most ancient centres of agriculture.

[28] Strabo, XVII, 2 ; Pliny, XVIII, 100.
[29] V. J. Perry, *The Growth of Civilisation*, p. 30.

Undoubtedly, soon after these centres of agriculture arose, they began to come in contact with one another. Emmer in all probability penetrated to Palestine from Egypt, and ordinary wheat (Tr. vulgare as well as Tr. turgidum) on the contrary, was brought to Egypt from Palestine or through Palestine. Not so long ago (in 1942) Debono's excavations in Egypt (in El-Omari near Helouân) yielded a special variety of wheat (Tr. monococcum) peculiar to Asia Minor and not met with to this day south of the Taurus and Amanus mountains [30]. Undoubtedly this data should be verified again. Helbaek disputes the conclusion that the remains of cereals found in El-Omari excavations are Tr. monococcum. But if the conclusions of Debono, accepted also by the noted archaeologist V. Gordon Childe [31], prove correct, then the agricultural centre in Asia Minor had in the neolithic period (to which the settlement in El-Omari belongs) a definite influence on Egypt.

II

Highly interesting and important is the question of the mutual relations between the agricultural centres of Egypt and Mesopotamia. Direct connections between the Nile Valley and the basin of the Tigris and Euphrates were established only in the 2nd millennium B.C. The suppositions that intercourse between these two lands existed earlier have not received convincing confirmation. It is, in particular, striking that the names of cereals in the Sumerian language have nothing in common with the Egyptian names for the same crops. The impression is created that in the period when the Sumerian people predominated in Mesopotamia there was no contact between the farmers of the two great river valleys, and that each people conducted its economy along different lines. Considerable changes took place, however, in the period when the Semites were widespread in Mesopotamia, a period corresponding to the 3rd millennium B.C. The Semitic languages, as we know, have a number of features in common with Egyptian. Modern Soviet linguistics today tends to the view of a unified Semito-Hamitic family of languages.

All this undoubtedly attests to the fact that at a certain period the forbears of the Egyptian and Semitic peoples were in close contact with each other. Was this before or after the transition to agriculture? This question can be answered only on the basis of an analysis of agricultural terms. If we accept this approach, then the first thing that strikes our attention is the full agreement between the ancient Egyptian

[30] *Annales du Service des antiquités d'Egypte*, Le Caire, XLVIII, 1948, pp. 567-69.
[31] H. Helbaek, "Queen Ichetis Wheat", *Det Kongelige Domske Videns Kabernes Selskab, Biologiske meddelelser*, 1953, 21, NC 8, p. 17; V. Gordon Childe, *New Light on the Most Ancient East*, London, 1952, p. 40.

word *bd. t.* (emmer) and one of the designations of this cereal in the ancient Akkadian tongue. This fact was noted long ago by the Assyriologists H. Zimmern [32] and B. Grozny [33] and, as far as I know, the connection which they pointed out has not aroused any objection. It is significant that both the Egyptian and Assyro-Babylonian terms are in the feminine gender and it may be supposed that they date back to the time of the matriarchate, when women did the farming and the spirit of grain was still regarded as a feminine deity. The two terms became calendar designations. The sixth month of the ancient Egyptian calendar (December-January) was called *šf-bd.t* [34], while in the Assyro-Babylonian calendar the corresponding term became the name of the month before the last (January-February)—*šabotu* [35]. Another instance in point is that the most wide-spread drink in Egypt and Mesopotamia, a beer made of barley, is denoted in the Egyptian and Assyro-Babylonian languages by similar words (ḥnkt and ḫaḳu). B. Grozny presumed that this was a case of direct borrowing by the Assyro-Babylonian language. V. V. Struwe, Soviet Academician, proved that the term *ḥnḳ.t* is a pure Egyptian word [36]. Thus we have another example of the parallel development of Egyptian and Assyro-Babylonian languages from a common stem. This, of course, is not an instance of N. Y. Marr's ill-famed theory of development by stages, but speaks rather of the close contiguity of the peoples who created the above-mentioned languages. Where could this contiguity have taken place?

The answer to this question depends on the solution of the problem of the ethno-genesis of the Semites. The homeland of the latter, as we know, has been sought for in Arabia and in Africa (T. Neldek) and along the shores of the Caspian Sea (B. Grozny). One thing is quite certain: Semitic tribes penetrated into Egypt, Palestine and Mesopotamia at all times, but written sources have survived from Arabia only. This may or may not have been their original homeland, but they were firmly established there before 3000 B.C. We still know nothing definite about the time and the circumstances under which agriculture arose in Arabia. The vast Arabian peninsula has hardly been studied up to now from an archaeological point of view. In any case there is no doubt that several thousand years before our era Arabia was less of a desert and less waterless than it is now. Herodotus retained a distant recollection of a rather

[32] Heinrich Zimmern, *Akkadische Fremdwörter als Beweis für babylonischen Kultureinfluss*, Leipzig, 1917, s. 55.
[33] F. Hrozny, *op. cit.*, s. 55.
[34] D. Olderogge, *The Deity of the Corn-Power*, London, 1933, Société pour les études de l'ancien Orient, Publications No 1/8, pp. 34-38.
[35] F. Hrozny, *op. cit.*, s. 59.
[36] W. S. Struwe, *Mathematischer Papyrus des staatlichen Museums der schönen Künste in Moskau*, Berlin, 1930, s. 53-54.

big river Corys, which flowed into the Eritrean Sea [37], while the existence of very real traces left by ancient rivers, in the form of numerous wadi, shows that Corys was not the only water artery of the peninsula.

Under no circumstances can one agree with Edward Meyer who, in criticising the numerous fantasies of Hommel and H. Winkler regarding the Arabian kingdom of Musri, goes to the other extreme and considers that there were never any considerably sized rivers in Arabia [38]. In the period when the last glacier in Europe melted, the climate in Arabia and North Africa must have been much more humid than later, and in the course of the last ten to fifteen thousand years it has been growing ever drier and drier. Thus by the time the first waves of Semitic settlers left Arabia (very likely in the 4th millennium B.C.) agriculture was fully possible in many parts of the land, and it is not without grounds that the Sumerian traditions place the first tillers of the soil on the island of Dilmun (on the Persian Gulf) near Arabia. In addition to the above-mentioned linguistic parallels there is still another fact to substantiate that the ancient Arabian (Semitic) centre of agriculture was connected with ancient Egypt, namely, that the modern emmer of Yemen is, according to observations of botanists, very much akin to that of ancient Egypt. K. Flaxberger and N. I. Vavilov classify both in one subspecies or group, subspecies abyssinicum, which is characterized by small ears, small grain, low height, quick ripening, certain features of the leaves and comparative susceptibility to yellow and brown rust [39]. Hence there must have been some sort of connection between the ancient tillers of the soil of Egypt, Arabia and Ethiopia (Abyssinia). Judging from the historical data available to date, Egypt played the leading role here, with the other two centres dependent on her.

III

In Egypt itself, agriculture, according to all relevant testimonials, originated in the north, in the Delta, and then gradually spread to the south. It is not fortuitous that the ancient Egyptians associated the front with the south, the rear with the north, the right with the west and the left with the east. This word usage reflects a recollection of the systematic migration of tribes from the north to the south. On the other hand, archaeological excavations show that the most ancient big farming settlements in Egypt arose in the north. It was discovered by an expedition of the Vienna Academy of Sciences in 1928 between Vardan and Merimde-Benisalâm on the western outskirts of the Delta. These excavations which lasted over a period of thirty years have

[37] Herodotus, III, 9.
[38] Ed. Meyer, *Geschichte des Altertums*, B. I, Hälfte 2, 1909, s. 351-352.
[39] K. Flaxberger, *op. cit.*, p. 504.

furnished invaluable material for the decision of the question of the origin and the first stage of the development of agriculture in Egypt [40]. This settlement undoubtedly belongs to the neolithic age. The Austrian scientist H. Yunker sets its date at about 5000 years B.C. No traces of metals have been found in this locality, hence, it must have been completely deserted before the beginning of the aeneolithic period. There is no doubt that the principal occupation of the settlers was agriculture. The usual offering brought to the dead was grain which was scattered near the head and hands of the huddled corpse ; this alone indicates that bread must have been the staple food. Preserved also are round stones which served to grind the grain, and a mortar, too, was found set in the ground and supported underneath by stones, pieces of pottery and bones. H. Yunker supposes that the flour obtained from this primitive sort of grinding was used for making flat cakes ; these were baked on flat brick slabs that were found by the expedition. Other objects that attest to the role of agriculture are flint sickles, threshing floors consisting of large round pits lined with matting, and, lastly, oval silos made of clay.

It is not difficult to understand why it was precisely on the edge of the Delta that agriculture became so developed in the neolithic period proper when metals where entirely unknown. A preliminary condition for the successful development of farming is a sedentary mode of life. And this was quite possible in the region of Merimde-Benisalâm, for the western arm of the Nile abounded in fish. The fishing-rods made of horn and bone and oval plummets for nets found here are sufficient proof that fishing was practised. Hunting, it seems, played a minor role. Only hippopotami were killed in great number. One can well understand that it is easier for a fisherman who remains in the same place, than for a hunter, to gather and then plant wild cereals.

Another important proof that the inhabitants of Merimde-Benisalâm led a sedentary life is the existence of pig breeding. This branch of cattle-raising excludes the possibility of a nomad life and testifies to steady habitation in one place. Neither is it a chance circumstance that agriculture developed not in the depths of the Delta but rather on its outskirts. To penetrate into the swamps was no easy matter and could not be accomplished quickly, the more so because the climate of Lower Egypt in the neolithic age was more humid than it became subsequently. In that period there was sufficient moisture on the outskirts of the Delta for crop raising. One important find proves that there was ample sub-soil water. Clay vessels for collecting water were found

[40] H. Yunker, *Festschrift, P. W. Schmidt*, s. 888-889 (For a short account by H. Yunker on the first archaeological expedition see *B. Forschungen und Vorschritte*, 1931, No 1, s. 1-2).

under the floors in several dwellings of Merimde-Benisalâm. Consequently, the inhabitants of this locality very likely suffered more from the dampness than from the dryness of the climate. The homes examined by us in the settlement were made of logs which shows that forests still existed. At that time it was not necessary to water the fields. This necessity arose later when the climate became ever drier. Similar conditions existed also on the eastern outskirts of the Delta. True, we have no archaeological data to this effect, but then the agricultural cult of Osiris in Busiris is sufficiently indicative. Such a cult could arise only amidst a sedentary people long engaged in cultivating the soil. Agriculture developed early in the Faiyum oasis situated near the southern outskirts of the Delta [41]. In Upper Egypt, on the other hand, signs of agriculture appear later and are not at all as clear-cut as in the north. True, in the district of Tasa (somewhat south of present-day Asyut), grains of barley and emmer and hand grain-grinders were found in sites of the neolithic period. However, the Tasa culture is considered as belonging to the end of the neolithic period and was already being supplanted by the aeneolithic Badari culture [42]. Moreover, agriculture was not as important with the Tasian people as it was with the inhabitants of Merimde-Benisalâm. According to V. G. Childe the economy of the Tasians was not yet of a purely sedentary character, as can be concluded from the Tasian graves which are scattered in small groups at considerable distances from one another. The main sources of food, apparently, were hunting and fishing [43]."

Agriculture in southern Thebaid developed still later and more slowly. Excavations of the British archaeological expedition in Armant leave no room for doubt on this score. The Egyptian investigator Hussein, who studied the stone implements found by this expedition, came to the conclusion that the hunting weapons unearthed in the lower layers of the settlement are more perfect, whereas the later ones evince all signs of technical deterioration. On the contrary, implements connected with the tilling of the soil gradually improved, which testifies to a "very slow" (Hussein's expression) transition from one form of economy to another [44]. In order to understand the full value of these observations for the solution of our problem, it is necessary to bear in mind that the lower layer of the Armant settlement corresponds chronologically to the Badari culture, but there are, it seems, still later sites and burial grounds than the Tasian.

On the basis of the aforesaid the trend of agricultural development in Egypt becomes sufficiently clear. In the Delta it develops widely at

[41] G. Childe, *op. cit.*, pp. 35-36.
[42] *Ibid.*, *op. cit.*, p. 44-46.
[43] *Ibid.*, *op. cit.*, p. 33.
[44] R. Mont and O. Myers, *Cemeteries of Armant*, London, 1937, p. 227.

the beginning of the neolithic period, which leads us to presume that there was an earlier preparatory stage corresponding approximately to the time of the Palestinian mesolithic period (Natufian culture). Very likely agriculture spread to Middle Egypt and the Faiyum oasis somewhat later. Only by the end of the neolithic period did agriculture acquire real significance in northern Thebaid, while in southern Thebaid it began gradually to supersede hunting only in the aeneolithic period. This process took place still later in Nubia. Naturally, further discoveries and observations will correct and improve upon this scheme but I consider that it correctly represents the general line of development. In this connection it is necessary to reconsider the opinion extant in science that mountainous areas were of singular importance to primitive agriculture. Academician N. I. Vavilov formulated this idea as follows : "Mountainous relief favoured life in small groups ; the development of human society started from this phase. There is no doubt that the settlement of huge river basins like those of the Lower and Middle Nile, the Euphrates, Tigris and Indus could only have been within the powers of a population united in large groups, which naturally could have taken place at much later stages of evolution of human society. Primitive man, the primitive farmer lived, as he still lives to this day, in small isolated groups, and for him the mountainous tropics and subtropics represent the most favourable conditions [45]."

It seems to me that such a viewpoint is too onesided. Of course, N. I. Vavilov is right when he says that it was not within the power of the primitive farmers to settle large river valleys. At the same time it should not be forgotten that favourable conditions exist for the rise of agriculture at the mouths of deep rivers and especially where they separate into numerous branches. In such places agriculture could at first do without irrigation and only later it developed on the basis of irrigation. An abundance of fish provided excellent conditions for a sedentary life and this in turn facilitated the transition to agriculture. The soil formed by river deposits was sufficiently fecund and friable. According to Herodotus, even in his time, a primitive method of sowing had been preserved which did not require preliminary tilling of the soil. The seed was thrown right into the moist earth after the Nile waters had abated and then pigs were driven on to the field to trample the grain into the soft soil [46]. Undoubtedly Herodotus exaggerated and generalized individual cases, representing the survival of old customs as a prevalent system of agriculture. Yet, in the initial stage of the development of agriculture, not in the Vth century, but in the Vth millennium B.C., such primitive methods which excluded the use not only of

[45] N. I. Vavilov, *op. cit.*, p. 13.
[46] Herodotus, II, 46.

the plough but even of hoes or digging poles were quite possible and likely. Incidentally, it is precisely in the Merimde-Benisalâm settlement that many bones of domestic pigs have been found [47], whereas pig-breeding has not been registered in Upper Egypt in the corresponding period. The planting of uncultivated fields is confirmed also by ethnographic parallels. Such a method was used in the last century by the Hodendoa tribe in the Sudan [48]. There is no doubt that such methods of farming could easily arise in swampy river estuaries. These would have been impossible in mountainous places and the tilling of elevated fields presupposes a much later stage of hoe and particularly of plough farming.

Naturally, one should take into consideration the negative aspects of life in the Delta (as well as in the lower reaches of the Euphrates, Tigris, Indus and other rivers). The unhealthy climate of swampy places, the swarms of mosquitoes complained of by an Egyptian author when speaking of his travels in the Delta, all this caused no little annoyance to the ancient inhabitants of the lower reaches of rivers, but, on the other hand, the swamps protected them from enemies, so that not without reason do the classical authors note the inaccessibility of the inhabitants of the "swamps", who found refuge in their distant shelters during the times of the Ethiopian (Nubian) or Persian rule and refused to recognize the authority of the mighty alien rulers [49]. Slowly but steadfastly, human labour surmounted all obstacles. According to all data, drainage canals were first dug in the lower reaches of large rivers. It was much easier to drain the water off narrow river branches than to dig a canal from the main stream. Land was also reclaimed from the swamps by filling them in. Herodotus cites a very interesting incident in the period of Ethiopian rule in Egypt (VIIIth century B.C.). King Anysis, who fled from Sabacon (Shabaki) to the interior of the Delta gave orders that the island Elbo be filled in. The work lasted for fifty years. Earth and ashes were used for the purpose and as a result of long and persistent labour an area of one hundred square stadia [50] was reclaimed from the swamp. It is to be presumed that similar undertakings were carried out in much earlier times, and if the Delta became a thickly populated and rich region, this was achieved as a result of the work of many generations.

In general I do not believe that the trend of agricultural development in Egypt can be regarded as universal. Undoubtedly different geographical zones had their own peculiarities of development. Nevertheless, I believe that in lands like Egypt watered by large rivers,

[47] *Forschungen und Vorschritte*, 1931, No 1, s. 2.
[48] G. Childe, *op. cit.*, p. 32.
[49] Herodotus, II, 137 ; Thucydides, I, 110.
[50] Herodotus, II, 140.

the first agriculturists appeared in the lower reaches of the rivers and gradually spread to the upper reaches. As far as Egypt is concerned there is no doubt that such was the path taken by the new form of economy.

IV

In conclusion I would like to say a few words about the changes which took place in agriculture in Egypt over the period of five thousand years that separates the agriculturists of Merimde-Benisalâm from the Kingdom of the Ptolemies.

Despite the stagnant character of ancient Egyptian society it nevertheless advanced, although with long interruptions. This received expression in the development and improvement of agricultural techniques and the introduction of new cultivated plants. One is astounded at the lack of variety in the excavated remains of cereals of the archaic period. If we exclude the solitary find of Triticum monococcum in El-Omari (which has been disputed, as we know), then we can confidently say that in the 4th and 5th millenniums B.C. only emmer and barley grew in Egyptian fields. The lack of rye is not surprising for it was entirely unknown in the Ancient East, while in Europe it only appeared in the Iron Age and for a long time was regarded as a weed. Oats, too, were nonexistent in archaic and in Pharaoh Egypt, although in neighbouring Syria they were known in the 1st millennium B.C. and perhaps even earlier. What is much more surprising is the absence of ordinary wheat in ancient Egypt, which, as we noted, contrasts this country to Palestine. It was only in the time of the Ancient Kingdom that this cereal appeared in the Nile Valley and is from time to time mentioned in documents as *sat*. Down to 1000 B.C., however, it was a rarity and could in no case supplant emmer.

Undoubtedly the conservatism of the ancient Egyptian slave-owners which interfered with the timely change of the staple agricultural crops brought about highly unfavourable phenomena. As extra labour was required for cultivating emmer and finally obtaining bread of a lower quality, this placed the economy of Egypt in a worse position than that of the agricultural lands where the more productive kinds of wheat prevailed.

Completely absent in the pre-dynastic and very likely in early dynastic Egypt were summer crops typical for the East : millet, Hungarian millet, durra, maize. And even later these crops were introduced slowly and we find them mentioned only sporadically and accidentally [51]. Leguminous plants (beans, lentils) began to be cultivated in Egypt

[51] V. Loret, *La flore pharaonique*, Paris, 1887, pp. 8, 12 (Nos 3, 4, 20).

only from the time of the Middle Kingdom [52]. Thus the varieties of cultivated plants in ancient Egypt increased slowly but steadily, with two principal crops—emmer and barley—remaining first and foremost.

The correlation between these two dominant crops depended on local conditions. Particularly favourable conditions for the cultivation of emmer existed in the Delta. Judging by the finds in Merimde-Benisalâm emmer was the only cereal here and thus, in its most ancient period, the agriculture of Egypt was of the one-crop type. Subsequently, the Delta too became known for its emmer. The inscription on the Carnarvon Tablet informs us that the Hyksos brought so much of this cereal from the north for the rich of Upper Egypt that it was fed to the pigs [53]. On the contrary, barley was evidently preferred in Thebaid. It is often referred to in documents of that region. Especially indicative are the records of tributes in different Upper Egyptian nomes inscribed on the walls of the tomb of Rekhmir (above the carved figures). Barley appears here as the principal variety of grain [54].

It is not without reason that one of the names for this cereal in the Egyptian language was "šema", i.e., "Upper-Egyptian" [55]. Naturally, the absence of exhaustive statistical data prevents a final decision of this question. Nevertheless, some of the data at our command lead us to presume that in the more southern parts of the land the importance of barley gradually increased. We can surmise the reasons for this. As we know barley is more suited to a dry climate than emmer or wheat. Therefore in southern Egypt where rain nearly never falls conditions were most favourable for its cultivation. Then it must be borne in mind that barley was much cheaper than emmer and was eaten by the poorer sections of the population. As the social differentiation of the free population of Egypt grew the number of slaves increased, and the demand for this cheap food also increased so that barley was planted in ever greater quantities in those parts where it grew better than other grains. It is also well to remember that the favourite and most popular drink in Egypt—beer—has nearly always been made of barley.

Such are the characteristics of the ancient Egyptian centre of agriculture. Much of what has been said above requires further verification and more accurate checking but in any case there is no doubt that agriculture in ancient Egypt developed in the main independently and it should be studied not as a static but as a dynamic process, taking into account the local differences and the changing historical situation.

[52] D. G. Reder, "Attempts to Acclimatize Alien Cultivated Plants in Ancient Egypt", *Scientific Papers of the Moscow Region Pedagogical Institute*, v. IV, 1950, pp. 110-116.
[53] Tab. Carnarvon, 1, 6.
[54] K. Sethe, *op. cit.*, IV, 1127-1137.
[55] A. Erman und H. Grapow, *op. cit.*, I, s. 142.

J. A. MARAVALL

EL PENSAMIENTO POLITICO EN ESPAÑA DEL AÑO 400 AL 1300 *

Las fechas entre las cuales tenemos que desarrollar nuestra exposición no tienen, en la Historia de España, particular relieve. En torno al año 400, Prudencio nos muestra que la cultura de la Península ibérica es plenamente romana y que la visión del mundo y de la Historia poseídas por un escritor hispano de aquel tiempo son las que corresponden a la Roma imperial y cristiana, si bien el ambiente peninsular puede añadir matices peculiares a su pensamiento.

Tenemos, pues, que empezar señalando en la Península hispánica, durante el siglo V, la existencia del pensamiento político propio de la cultura latino-cristiana. Su más importante figura es Paulo Orosio, tan influyente en la formación de la primitiva mentalidad occidental. Orosio, en relación con San Agustín y San Jerónimo, sistematiza una filosofía cristiana de la historia, que concibe a ésta como una teofanía : « providentia... agitur mundus et homo ». El carácter universal de la Providencia divina, universaliza a su vez esa Historia en la que aquélla actua, historia que de este modo se convierte en asunto común de todos los humanos. El horizonte de la familia, de la ciudad, de la tribu, queda superado. Orosio contempla grandes agrupaciones de contenido eminentemente espiritual y aún, por encima de ellas, la totalidad de los humanos unidos en una común condición, en una misma naturaleza. Orosio se siente « inter Romanos, ut dixi, Romanus, inter Christianos Christianus, inter homines homo ». La idea de humanidad toma en Orosio, por primera vez, un valor netamente político y tan es así que en atención a él lleva a cabo la crítica de las acciones romanas. Por eso para él es « omni terra quasi patria ». Los reinos e emperios son instrumentos temporales y mudables de que Dios se sirve para llevar el género humano hacia su fin. De ahí la sucesión de los cuatro imperios

* Recomendado por el Profesor J. Pérez Villanueva.

— Babilonia, Macedonia, Africa (Cartago), Roma —, a través de los cuales se ha ido alcanzando una situación política en el mundo, necesaria para la propagación del Evangelio : la unidad de ley, de lengua y de cultura que ha hecho posible la paz universal, como nivel histórico necesario para la difusión del cristianismo. Si Orosio afirma « omnem potestatem a deo esse omnem que ordinationem » ; para él no se trata solo de que deriven su poder de Dios aquellos individuos que, justa o injustamente, gobiernan los pueblos, sinó que también viene de Dios la supremacía de un reino sobre otro, de cada uno de los imperios sucesivos que han existido sobre todas las provincias restantes [1]. Pero, al contrario de lo que creía todavía un Prudencio, para Orosio ya no está en el plan divino la permanencia de la superioridad de Roma. Los pueblos bárbaros, cuya persecución personalmente ha sufrido, no son, sin embargo, para él, como si lo son, en cambio, para otros muchos, mero azote de Dios y castigo del pueblo romano [2]. Esos pueblos bárbaros, — suevos, vándalos, hunos, borgoñones — son, en el pensamiento de Orosio, una nueva fase positiva de incorporación de la humanidad a la fé del cristianismo. Por eso los juzga favorablemente y valora sus virtudes y las ventajas que su presencia trae para los pueblos oprimidos por Roma. Y es que en Orosio se observa — y ello tiene un gran interés en la Historia del pensamiento político — junto a la idea universal de la humanidad, la presencia del sentimiento de los pueblos particulares y especificamente de esa Hispania tiranizada por Roma. En resumen, pues, Orosio nos deja una filosofía providencialista de la historia, la aplicación sistemática de la tesis del origen divino del poder, la formulación política de la idea de humanidad y, articulada con esta última, la idea de la pluralidad y particularidad de los pueblos, es decir, la idea de patria como factor político.

Durante el siglo V diversos grupos de procedencia germánica invaden España ; el último de ellos, el de los visigodos, va a hacer realidad esa nueva concepción histórico-política que hemos visto anunciarse en Orosio : mantenimiento de los valores universales de la romanidad, configuración de Hispania como una patria particular y diferente de otras muchas, desenvolvimiento de la vida política dentro de las concepciones fundamentales del cristianismo. El pensamiento político de los visigodos, como en general toda la cultura hispano-visigoda, es herencia de la Baja Antigüedad. Tal vez en ninguna otra parte como en España tenga aplicación la tesis de Pirenne sobre el final de la edad antigua y comienzo de la media. Se ha dicho que « el arte español de la época paleocristiana y visigoda forma, en su conjunto, la última fase

[1] *Historiarum adversum paganos libri VII*, ed. de Zangemeister, Leipzig, 1889 : las citas en las pags. 4, 144 y 35 respectivamente.

[2] COURCELLE, *Histoire littéraire des grandes invasions germaniques*, París, 1948.

del arte antiguo de la Península. Entre el siglo IV... y los siglos siguientes no se produce, en realidad, ningún cambio brusco »[3]. Pues bien, esto no solo puede decirse del arte, sino de la vida cultural íntegra, comprendido el dominio que ahora nos ocupa. De aquí que la cultura hispano-visigoda y con ella el pensamiento político de la época, sea continuación de la inmediata tradición del cristianismo primitivo. Y de aquí que si todavía Hidacio (segunda mitad del V) puede ser adverso a los invasores, desde su base hispano-romana, rápidamente ésta se incorpora y se funde con los grupos de visigodos.

De la etapa visigoda (siglos VI y VII) citemos a San Martín Dumiense[4], cuyas obras testimonian la supervivencia de abundantes elementos de la cultura clásica, una intensa influencia senequista, la preocupación por los aspectos educativos y morales de la política y de la vida social, la concepción moral de la realeza y de su misión contra los soberbios, según una neta reminiscencia de la antigua fórmula virgiliana[5]. Juan de Biclaro, obispo de Gerona, exalta la majestad real, cuyos símbolos, según la tradición bizantina, se había atribuído Leovigildo, rechaza al rebelde como tirano, negando, pues, el derecho de resistencia y concibe la Historia apoyada en dos puntos, el Imperio e Hispania[6]. San Leandro, cuya homilia « In laudem Ecclesiae » se conserva tal como debió ser pronunciada en la clausura del Concilio III de Toledo, afirma como principios fundamentales social-religiosos que el rey ha de asegurar los de unidad, amor y paz en el pueblo. A San Leandro cabe atribuir principalmente la concepción de la monarquía visigoda en términos político-religiosos, a través de los cuales del anterior caracter guerrero y racial del cuadillo germánico no quedan vestigios siquiera. Según estos Concilios toledanos (sobre todo del III al VIII), el rey es elegido por los magnates y alto clero, con consentimiento del pueblo, es consagrado y coronado con un ritual mixto civil y religioso, de modo que la unción, que tan largo futuro tendrá en las monarquías europeas, se practica por primera vez en España en 633 y todos los momentos de la actuación real van acompañados de ceremonias, himnos, preces, etc., de tipo eclesiástico[7]. Sin embargo, no es una organización teocrática, ni doctrinal, ni prácticamente[8]: Si el anatema es una medida política y si se acepta la tesis de que el Concilio puede

[3] Schlunck, « Arte visigodo », en el vol. III de la col. *Ars Hispaniae*, pag. 227.
[4] C. W. Barlow, *Martini Episcopi Bracarensis opera omnia*, New Haven, 1950.
[5] M. Martins, S. J., *Correntes da filosofia religiosa em Braga dos séc. IV a VII*, Oporto, 1950.
[6] Ed. de Alvarez Rubiano, en *Analecta Sacra Tarraconensia*, XVI, 1943; pags. 7 y 11.
[7] Algunos interesantes datos en Scudieri, « Alle fonti della cultura ispano-visigotica », en *Studi Medievali*, nº 16, 1943-1950, pags. 44 y ss.
[8] von Below, *Der deutsche Staat des Mittelalters*, Leipzig, 1925, pag. 192 y ss.

juzgar y deponer al rey (Suíntila ante el Concilio IV), es lo cierto que el rey preside los concilios y tiene que aprobar sus acuerdos para que tengan fuerza legal [9].

San Isidoro resume el pensamiento político de esta fase de nuestra historia. Según él, el poder de los reyes es establecido por Dios. Dios lo concedió a los príncipes, sobre aquellos que, no obstante, son iguales a ellos por su origen y su fin. Ese poder es un freno para contener a cuantos se inclinen a obrar mal, a quienes el que manda, por medio del temor, les impide ejecutar sus desmanes. De esta manera el poder de los príncipes se hizo necesario por el pecado, que inclina a los hombres al mal — tesis con la que San Isidoro se nos muestra inserto en los orígenes del agustinismo medieval [10].

Los príncipes, pues, se instituyen para imponer el bien sobre el mal. Su misión es, por tanto, obrar rectamente. Y de ahí que se dijera : « rex eris si recta facias ; si non facias non eris ». No hay cosa más contra Dios que aprovecharse arbitrariamente del poder, torciendolo de su fin y obrando sin norma ni temor, incurriendo en abusos, en injusticia, en crueldad. Frente a esto, el rey ha de gobernar de manera que con la ley los pueblos vivan honestamente. Para ello, no solo posee la fuerza de la ley, sino la del ejemplo. El ejemplo de los príncipes ordena o transtorna la vida de los súbditos — toda la literatura medieval de espejos se basará en esta idea. Como ejemplo supremo de rectitud, el rey debe acatar las leyes, lo mismo que las tienen que acatar los que le están sometidos.

Pero los reyes pueden desviarse de la recta manera de gobernar a que vienen obligados. En caso tal, la potestad que ejerce un mal príncipe también deriva de Dios : la potestad del buen príncipe viene de Dios propicio, la del malo de Dios airado. El mal rey es castigo que dispone la ira de Dios por los crímes del pueblo. Por eso, vemos a veces que por la maldad del pueblo cambia la condición de su rey, que de bueno se convierte en perverso. La doctrina del origen del poder y de la tiranía, propia del cristianismo primitivo, se sistematiza en San Isidoro y de él pasa a la alta Edad Media.

Dentro de la Iglesia, el príncipe tiene la potestad para mantener la paz y la disciplina eclesiástica e impone la ley a los rebeldes, completando con su poder la falta de medios físicos de fuerza que tiene la Iglesia. Su objeto es defender los miembros de Cristo porque miembros de Cristo son los pueblos fieles, y al gobernarlos óptimamente, con la

[9] Torres López, « El Estado visigodo », en *Anuario de Historia del Derecho español*, III, 1926, pags. 307 y ss.

[10] Empleo esta expresión en el sentido de Arquillière, *L'augustinisme politique*, París, 1934.

potestad que para ello recibieron, pagan su deuda a Aquel de quien su potestad procede [11].

Justicia y paz, en doble sentido civil y religioso, forman la misión del poder político que se cumple aplicando la ley. Pero esa ley no es, propiamente, obra suya. Aunque el príncipe la promulgue, más que dada por él, es reconocida o descubierta por él. La ley humana se funda, no en voluntad de legislador, sino en la costumbre de los pueblos — de ahí que hayan leyes diferentes, como diferentes son las costumbres de los diversos grupos humanos. La ley toma su fuerza de obligar de ser practicada por los antepasados y de ser tenida como costumbre propia por el pueblo. « Ley es constitución del pueblo que recibió su sanción de los ancianos, juntamente con el pueblo » [12].

San Isidoro, finalmente, con su Historia de regibus gothorum, en cuyo prefacio se lee el famoso « laus Hispaniae », concibe la vida política y con ella la historia como un acontecer peculiar e independiente de cada pueblo [13]. « Al leer a Hidacio, ha dicho Menéndez Pidal, asistimos al laborioso parto de España y de su historia ; en el Biclarense vemos crecer una historia de España, aunque sujeta todavía a una crónica de emperadores ; Isidoro es el primero que saca esa historia de la tutela imperial, para darle independencia y espíritu propio » [14].

No mucho después de este momento de plenitud isidoriana, esa Historia de España iba a sufrir un fuerte golpe con la invasión de los árabes. En el momento en que ésta tiene lugar, el conglomerado racial hispano-romano-visigodo ha alcanzado una unificación política, jurídica y cultural, sobre la base del legado de Roma, con una dosis de peculiaridad que, en el orden de los hechos y de las ideas, se observa en el reino y en la Iglesia visigodos. Para comprender lo que en España va a acontecer no basta con referirse a la invasión ; es necesario tener en cuenta esa alto grado de conservación del legado de la Romania, que en la Península se daba en vísperas de la irrupción sarracena [15].

Los pueblos europeos, sobre lo que en los siglos V y VI se hallan ya asentados firmemente grupos germánicos, son todavía en esa época

[11] La doctrina política de S. Isidoro se contine especialmente en su obra *Sententiarum libri tres*, publicado por Migne, en *Patrología latina*, LXXXIII, pags. 537-738, ver libro II, c. XLVII a LI.

[12] Para la doctrina jurídica isidoriana interesan, sobre todo, sus *Etimologias*, publicada en la primera parte del vol. de Migne antes citado. Hay trad. castellana de la B.A.C.

[13] Ed. de Mommsen, en M.G.H., *Chronica minora*, II, pags. 424 y ss. Sobre el pensamiento político de San Isidoro, ver J. L. Romero, « San Isidoro de Sevilla : su pensamiento histórico-político y sus relaciones con la historia visigoda », en *Cuadernos de Historia de España* de la Universidad de Buenos Aires, VIII, 1947.

[14] Menéndez Pidal, pról. al vol. III de la *Historia de España*, dirigida por el mismo ; la cita en la pag. XXXIV.

[15] Ver García de Valdeavellano, *Historia de España. I. Desde los orígenes da la baja Edad Media*, Madrid, 1952, pag. 260.

más romanos que germanos, por el mayor peso de la cultura latina y por ser más numerosa la población básica romanizada. Esta situación se da en España, como en la Italia del norte, como en Francia, etc. Es, sin embargo, una situación dinámica, evolutiva, a través de la cual y en el tiempo que sigue van granando las posibilidades del germanismo, cuya huella será cada vez mayor en Europa. En los siglos IX, X, XI, esos pueblos europeos, hasta el aquelo en que pretenden imitar a los antiguos, serán cada vez más germánicos (así, eminentemente, Carlomagno y su renovatio Imperii en la fecha auroral de la Navidad del año 800). En España, en cambio, esa posible evolución se corta por obra de la invasión árabe y ello produce un estancamiento o congelación de las supervivencias « antiguas », que en España, por otra parte, eran especialmente ricas. De este modo, el complejo cultural hispano-romano-visigodo se detendrá en su evolución, paralizado por la presión de los invasores, que, sin embargo, no pueden eliminarlo. Detenido, se conservará mejor ese estrato hispano-romano-visigodo que quedará incrustado en la vida española, dando lugar a ese fenómeno peculiar de nuestra vida social que Ortega Gasset ha calificado de supervivencia del « homo antiquus » en el sentido de hombre que conserva, no tanto en su cultura intelectual como en sus formas de vida cuotidianas, restos de la Antigüedad [16].

Esa paralización conservadora — que es a lo que yo llamo la « clave mozárabe » de nuestro destino histórico — se corrige parcialmente al empezar el siglo XI. A partir de ese momento se reanudará, en cierto grado, la evolución de elementos germánicos — en la literatura, el derecho, las ideas políticas, las costumbres sociales, etc., etc. — y se absorberá en grandes dosis, la cultura europea que se ha desenvuelto más libremente ; pero quedará siempre la fuerte impronta del legado hispano-romano-visigodo, conservado en los siglos de la cultura mozárabe [17].

De los siglos VIII a X no poseemos testimonios directos del pensamiento político, o por lo menos que tengan una propia pretensión doctrinal. En este aspecto, lo que se puede sacar de la llamada « Crónica mozárabe del año 754 » — o « Anónimo de Córdoba » — es insignificante. La conocida polémica sobre el adopcionismo nos ha legado un conjunto de epístolas de Elipando de Toledo, Felix de Urgel, etc., a Carlomagno, Alcuino y otros personajes de la corte franca, en las que podemos barruntar la concepción del rey como cabeza del pueblo cristiano, su vicariato divino, su ejercicio de una potestad pública, su con-

[16] Datos concretos sobre este fenómeno de supervivencia en Caro Baroja, *Los pueblos de España*, Barcelona, 1946.

[17] Sobre esto ver mi obra *El concepto de España en la Edad Media*, capt. III : « El factor mozárabe como sustrato hispánico », Madrid, 1954.

dición de funcionario civil y eclesiástico. Todo ello, pues, se liga a la tradición hispano-visigoda, a la que representan también, en el orden religioso y teológico, estos herejes adopcionistas. Por otra parte, los hispanos que ejercen altos puestos eclesiásticos y de gobierno en la corte franca, aparecen insertos en la misma tradición — así, Teodulfo Obispo de Orléans que él sí, a diferencia de los condes francos, concibe al nuevo emperador, como un emperador romano-cristiano. Interesa a este respecto, sobre todo, San Agobargo, arzobispo de Lyon, cuyas ideas sobre el « pueblo cristiano », la misión de la Iglesia y la función de la realeza, recuerdan las de la época visigoda — más concretamente su intervención en la asamblea de Compiègne, en la que se acuerda la deposición de Luis el Piadoso, y la doctrina en que este acto se apoya, parecen ligarse directamente al antecedente del Concilio IV de Toledo que condena a Suíntila y reconoce su destronamiento [18].

Las primeras crónicas de la Reconquista y algunos diplomas de la época nos permiten reconstruir el pensamiento político alto-medieval en los reinos cristianos de la Península [19]. En tales documentos se da un concepto del rey en el que predomina el carácter público de su potestad, con supremacía civil y eclesiástica, frente a la concepción patrimonial germánica — antes del año 1000 no hay ningún reparto de tierras que el rey efectue al morir entre sus hijos, ya que no es ni asimilable a este caso el de la sucesión de Alfonso III. Según la tradición del cristianismo primitivo (visigoda también e isidoriana) la figura del *rex* aparece en primer plano, desvaneciéndose la idea objetiva de *regnum* [20]; el rey dispone de poderes dados por Dios (empleo de la fórmula *« gratia Dei »* o equivalente), y esa su potestad le es dada para aplicar el derecho, haciendo justicia (el rey como *judex)*, según una fórmula de igualdad, dominando a los poderosos o tiranos *(debelare superbos)* —, en bien del pueblo y en defensa de la paz, que se interpreta en sentido cristiano.

Barrau-Dihigo comprobó, como un puro hecho, el de que los reyes hispánicos de la alta Edad Media no enuncian el reino sobre el que imperan. Ello deriva, sin duda, de que la primacía de la idea de *rex* sobre la de *regnum*, además del sentido general europeo que hemos indicado, tiene otro muy peculiar en España. Ese *regnum* que no es más que ámbito de la jurisdicción de un rey, sin entidad definida propia,

[18] Sobre San Agobardo y la asamblea de Compiègne, ver HALPHEN, *Charlemagne et l'Empire carolingien*, París, 1949, pags. 291 y ss., y bibliografía citada en esta obra.

[19] Nos referimos a la Crónica Albeldense, Crónica de Alfonso III y Crónica Profética, editadas por Gomez MORENO en su estudio « Las primeras crónicas de la Reconquista : el ciclo de Alfonso III », *Boletín de la R. Ac. de la Historia*, C., 1932, y también a la « Crónica del obispo don Sebastián », versión culta de la de Alfonso III, ed. por García Villada, Madrid, 1918.

[20] Ver GALIZIA, *La teoria della sovranità del Medioevo alla Rivoluzione francese*, Milán, 1951, pags. 19 y ss.

es una parte, aunque parte variable, movediza, transitoria, del « regnum Hispaniae ». Ese reino de España, al que se dirige el « laus » isidoriano recordado hasta el final de la Edad Media ; ese reino perdido por la injusta expoliación de que los godos fueron objeto por parte de los árabes, tiene que ser recuperado por los herederos de aquéllos, los reyes hispánicos, los cuales, de este modo, tienen como misión propia una tarea pública y común : la reconquista (es característico del pensamiento español el predominio de la idea de reconquista, sobre la idea de cruzada, de origen francés y eclesiástico).

A pesar de que esa tarea tiene un caracter tan militar, nuestro rey medieval no aparece concebido como un fuerte guerrero, un *vir fortissimus*, sino como un gobernante público y objetivo, un *princeps potentissimus*, que aplica su potestad a un fin general : poblar, reconquistar, defender al pueblo, ampliar y fortalecer el reino, etc. A ese caracter se corresponde su condición de ungido. Cualquiera que sea, en la realidad, el valor a atribuir a esta fórmula, es lo cierto que crónicas y diplomas piensan que el rey ha recibido la unción : « hunctus est in regno », « princeps untus », son expresiones frecuentes. En definitiva, ello implica el reconocimiento de un origen divino del poder real, que se traduce en el uso corriente de la fórmula « gratia Dei ». Ligado a éste se halla el problema del origen del título, es decir, del caracter hereditario o electivo de la realeza. En rigor, nuestros reyes son considerados, siguiendo la doctrina europea, como provistos de un triple título : divino, hereditario y electivo. Si la Crónica Albeldense dice de Alfonso III que reina « in patrio solio », habiendo señalado antes el parentesco de cada nuevo rey con el anterior, la más culta de estas Crónicas, la del obispo Don Sebastián, alterna en referirse a herencia y elección, y tal es también lo que se trasluce en la Crónica de Sampiro. Lo que no cabe es pensar que constituyeran aquéllas — la herencia y la elección — procedimientos regulados de accesión al trono, como son considerados modernamente, sino que eran títulos, más o menos explícitos, concurrentes en legitimar un poder. Ya en 1022, Alfonso V explica así su posición : « Ego serenissimus et princeps untus ad domino meo Adefonsus nutu divino rex in regno pro avorum vel parentum meorum electum » [21]. Sin embargo, la elección, en general, alude a una participación del pueblo [22], que tiene el valor de un reconocimiento o constatación : todavía puede verse así en el episodio referente a la minoridad de Fernando III que la llamada « Crónica latina de los Reyes de Cas-

[21] Publicado por Sánchez Albornoz, « Algunos documentos leoneses de Alfonso V », en *Cuadernos de Historia de España*, nº IV, pags. 352 y ss.

[22] Son frecuentes en nuestros documentos medievales referencias al consentimiento popular del tipo de la que contiene la Historia Compostelana en relación con doña Urraca : « Ex communi conventu cleri et populi vocant eam Dominam suam », I, 109 ; Flórez, *Esp. Sagr.*, vol. XX, pag. 212.

tilla » cuenta [23] — esa misma Crónica que, aludiendo al consabido texto bíblico, se refiere a la « gratia divina in cuius manu sunt omnium potestates et omnia jura regnorum » [24].

Con una potestad, tan alta por su origen e induscutible por la aceptación general que ha recibido, al rey cumple administrar justicia. La Crónica albeldense da esta imagen de un buen rey (Ramiro I) : « Virga justitiae fuit. Latrones oculos evelendo abstulit. Magicis per ignem finem imposuit ; sibique tirannos mira celeritate subvertit atque exterminavit » [25]. En general, las fuentes españoles interpretan esta función regia en un sentido bastante amplio de gobierno y administración. En 1033, Sancho III de Navarra dice de sí mismo : « ad regni gubernacula perveni, regimen et curam, sollicitudinem et vigilantiam ecclesiasticarum rerum quam secularium, michi esse commissas intellexi » [26], documento en el que, por otra parte, vemos afirmarse al rey como cabeza de la Iglesia, dotado de una cuasi sacerdotalidad, según la corriente europea de la alta Edad Media.

El rey español, según los datos doctrinales que podemos recoger, no es el representante de los grandes terratenientes feudales, como dice Dopsch de los reyes europeos. El rey español — y los condes de Barcelona entran plenamente bajo esta rúbrica — es autoridad pública que detenta una potestad de origen divino y base democrática, para gobierno y defensa del pueblo. Lo hemos visto en las Crónicas y lo declaran también los diplomas ; en uno de estos, de muy temprana fecha (año 928), refiriéndose a Sancho Garcés I, se dice « erexit Deus regem Sancio Garsianes dominun et gubernatorem de patria et defensorem populi » [27].

De este modo, el rey aparece como instrumento de la paz pública, de la seguridad. La manifestación más curiosa de esta manera de entender la función de la realeza, implícita ya en el texto de la Albeldense que antes citamos, se encuentra en el elogio de Alfonso VI que hace la « Crónica del obispo Don Pelayo » cuando asegura que en tiempo de aquél, una mujer sola podía andar por campos o por montes, por lugares habitados o en despoblados, con oro o plata en la mano, sin que nadie se arriesgara a hacerle el menor daño. Desde una altura propiamente mayestática, el rey impone su justicia y su equidad a todos, a « omnes potestates nobiles et innobiles, divites et pauperes qui erant in regno suo » [28]. Esta situación no deriva de una relación contractual, no tiene caracter personal, sino territorial, y de esa seguridad real gozan también

[23] *Chronique latine des rois de Castille*, edc. de Cirot, Burdeos, 1913, pag. 93.
[24] *Ed. cit.*, pag. 25.
[25] Ed. de Gómez Moreno, pag. 603.
[26] *Cartulario de San Salvador de Oña*, ed de Del Amo, Madrid, 1950, nº 26, pag. 47.
[27] *Colección diplomática de San Juan de la Peña*, ed. de Magallón, Madrid, 1903-1904, doc. nº IX.
[28] Ed. de Sánchez Alonso, Madrid, 1924, pags. 83 y ss.

los « negotiatores et peregrini » que el desarrollo económico y material del reino permite ver por caminos y ciudades.

La idea de la preminencia real es, pues, un dato del pensamiento político español, con perfecta continuidad mantenido, desde los visigodos hasta empalmar con la recepción del Derecho romano. Este elemento doctrinal hay que tenerlo también en cuenta al considerar el problema del feudalismo en España. Resulta que en España, a pesar de la temprana presencia, entre los visigodos, de instituciones prefeudales, como Sánchez Albornoz ha demostrado ; a pesar de que, sobre todo a partir del momento en que se hace más intensa la influencia francesa (comienzos del siglo XI), existen propiamente las instituciones que típicamente integran lo que Ganshof ha llamado la feudalidad ; sin embargo, no existe un feudalismo, una sociedad cuya estructura esté determinada por los factores feudales. Las condiciones económicas que derivan de la Reconquista, según Sanchez Albornoz [29], y la conservación en gran medida de una economía dineraria, según se desprende de las investigaciones de García de Valdeavellano [30], son causa de esa ausencia de un tipo de sociedad, tan común en la alta Edad Media al resto del Occidente europeo ; pero a esas circunstancias de hecho habría que añadir un factor doctrinal o ideológico : la concepción de la realeza como una función pública. Según ello, — y las fuentes cronísticas y documentales así permiten verlo, — la relación política se establece, no sobre la base del vínculo contractual interindividual, de vasallaje, sino sobre el vínculo común y objetivo de súbdito. A este sentimiento responde la visión de la relación entre rey y vasallo en el famoso *Poema de Mio Cid*. En esta obra, según las investigaciones de Hinojosa, podemos reconocer que, los elementos jurídicos que en ella juegan, son de carácter germánico [31]. pero no lo es, en cambio, la concepción política en que el *Poema* se basa, es decir, su manera de ver las funciones de rey y de súbdito y, en consecuencia, la relación entre éstos — el desnaturarse, contra los efectos de un acto de tal condición en el Derecho feudal, no corta la relación política en el *Poema*, porque algo hay más allá del contrato que no se rompe con éste, algo que no es feudal, sino público.

En la segunda mitad del XII algunos diplomas hablan de la majestad real, refiriendose a ella más como calidad que como título conferido personalmente a un rey. En documentos catalanes de fines de ese mismo siglo se declara como principio de derecho la máxima « quod

[29] « España y Francia en la Edad Media. Causas de su diferenciación política », en *Revista de Occidente*, Madrid, 1923, I, pags. 294 y ss. ; y también *En torno a los orígenes del feudalismo*, Mendoza, 1942, III, pags. 287 y ss.

[30] « Economía natural y monetaria en Castilla durante los siglos IX, X y XI », en la revista *Moneda y Crédito*, Madrid, 1944, nº 10.

[31] « El Derecho en el Poema del Cid », en el vol. de *Obras* de HINOJOSA, ed. y estudio de García Gallo, Madrid, 1948, pags. 181 y ss.

principi placuit legis habet vigorem ». A comienzos del XIII, las Crónicas — así, la llamada Crónica Najerense — conocen los refranes en que se enuncia la superioridad de hecho de la arbitrariedad real sobre las leyes : « ad libitum regum flectat cornua legum » [32]. Pero todo esto no supone una radical novedad ; en cierta forma, síguese la línea tradicional en los reinos peninsulares.

Esa superioridad real acude a expresarse en España, en ocasiones, bajo la fórmula imperial. En las condiciones que la Reconquista impuso, de pluralidad y mutabilidad de los reinos hispánicos, se produjo una cierta relativización del título de rey, lo que no es incompatible con el mantenimiento de las calidades que hasta aquí hemos señalado en el sistema de los reinos hispánicos. De ahí, la tendencia a construir como un *rex regum* o *rex magnus* o *imperator* la figura del rey superior — en lo que se juntan una influencia carolingia y otra oriental (alguna vez se usa la forma *« basileus »*). Esta superioridad imperial puede referirse a la que se ejerce o se pretende ejercer sobre los otros « reges vel principes Hispaniae », como sucede eminentemente en los casos de Alfonso VI y Alfonso VII de León y Castilla y Alfonso I de Aragón [33].

Tampoco la preminencia de que se considera provisto el rey no contradice una clara idea de la limitación de su poder y, sobre todo, de la rectitud con que se ha de aplicar. Desde las más primitivas Crónicas tenemos un repertorio de juicios adversos, enérgicamente desfavorables, sobre unos u otros reyes, por estimarlos como malos gobernantes que emplearon torcidamente su potestad. Claro que, sin embargo, no serán considerados como tiranos. Siguiendo la doctrina del cristianismo primitivo, de Orosio a San Isidoro, tirano es el usurpador de un poder que no le pertenece legítimamente, es decir, lo que la doctrina de la baja Edad Media llamará tirano por defecto de título. El mal, rey, en cambio, que el castigo de Dios depara por los crímeres de un pueblo, sigue siendo no menos rey. Hay que llegar a fines del XI para observar que, con las influencias francesas y eclesiásticas, penetra también la noción de tirano por mal ejercicio del poder ; efectivamente, por primera vez en las crónicas de comienzos del siglo XII se aplicará el epiteto de tirano a algún rey que abuse de la potestad, recibida para servir a la justicia, empleándola injustamente [34].

Sobre como se ha de ejercer rectamente el poder, tenemos también en las primeras Crónicas de la Reconquista, un cuadro aretológico propio de la figura del rey y que se nos patentiza en los elogios de los buenos reyes : justicia para contener a los malos, fortaleza para impo-

[32] Ed. de Cirot, en *Bull. Hisp.*, XI, 1909, pag. 277.
[33] Ver M. PIDAL, *El Imperio Hispánico y los cinco reinos*, Madrid, 1950.
[34] Algunos datos sobre este tema en mi artº « La morada vital hispánica y los visigodos », en la revista *Clavileño*, Madrid, 1955, nº 34.

nerse a los tiranos, benignidad para los pueblos, autoridad con todos, etc., etc. Tal vez la fórmula más concisa y completa sea la de la Crónica del obispo don Sebastián en el elogio de Ordoño I : « Magnae potentiae atque modestiae fuit ». En general, esas virtudes dependen de una formación moral que sigue vias intelectuales, o sea, de una verdadera sapiencia. De aquí que la Crónica Albeldense llame a Alfonso III « scientia clarus », mientras que del mal rey el monje Sampiro, en su Crónica escrita en el siglo X, diga (se refiere a Ramiro III) : « in modica scientia positus » [35].

Lo que acabamos de decir explica el temprano desarrollo de una línea adoctrinante y moralizadora en el pensamiento político. Como un antecedente de esta corriente pedagógico-política cabría citar la obra de la condesa Duoda, visigoda, al parecer, de tierras que hoy llamanos catalanas y esposa de Bernardo de Septimania [36]. Ya en el XII a un judio-español converso, Pedro Alfonso, en su « Disciplini clericalis » se le ocurre fecundar esa dirección literaria con la incorporación de la fabulística oriental [37]. El « Sendebar », el « Calila y Dimna », continuan esta nueva literatura de consejos ya en la centuria siguiente. La floración de manuales ético-políticos, de « espejos de príncipes », es abundantísima [38], llegando a dar las grandes figuras de Raimundo Lulio y del infante don Juan Manuel.

Pero la limitación del poder real no se buscará solo por el lado de los consejos morales, sino que se intentará también la organización de una red institucional. Tienen un gran interés a este respecto los decretos de Alfonso IX de León en 1188 [39]. De esos decretos resulta que en España se establece, por primera vez en Europa, es decir, antes que en Inglaterra, la participación del estado llano, del pueblo, en las Asambleas políticas. En 1188 aparecen, junto a los obispos y magnates, los « ciudadanos elegidos por cada ciudad » y promete el rey en adelante no tomar acuerdos sin reunir a los tres estados. Pero además, en esas Cortes de León se producen una serie de declaraciones, con sus correspondientes garantías, mediante las que el pueblo trata de defender su derecho frente a los poderosos y aún frente a los reyes. Se establecen medios de asegurar el desarrollo de un procedimiento judicial según derecho, con una última instancia de apelación ante el rey. En torno a esa forzosidad del procedimiento se engarzan una serie de garantías :

[35] Pérez de URBEL publica esta crónica en su obra *Sampiro. Su Crónica y la Monarquía leonesa en el siglo X*, Madrid, 1952 ; la cita en la pag. 342.

[36] Publicado por BONDURAND, en *L'éducation carolingienne. Le manuel de Dhouda (843)*, París, 1877.

[37] Ed. y traducción de A. González PALENCIA, *Escuela de Estudios Arabes*, Madrid, 1948.

[38] Ver MILLARES, *Literatura Española hasta fines del siglo XV*, Méjico, 1950, pag. 113, y bibliografía citada en esta obra.

[39] Muñoz ROMERO, *Colección de Fueros Municipales*, Madrid, 1947, I, pags. 102 y ss.

el derecho al propio juez ; el derecho a fallos legales ; la limitación legal de ciertas penas, etc. Junto a esto existe el deber de respetar y ayudar a la justicia. Este documento leonés de Alfonso IX contiene, además, una iniciación del derecho de inviolabilidad de morada, la defensa del derecho de propiedad, y el principio de paz real que impone la justicia pública a toda iniciativa de guerra o venganza privadas. Las disposiciones de estas Cortes de León y las de muchos fueros de ciudades han permitido algunos investigadores — el inglés Webster, los alemanes Brunner, von Keller, Wohlhaupter, el español Riaza, etc., señalar los decisivos antecedentes hispánicos en el desarrollo modernos de los derechos individuales. Desde fines del siglo XIX era ya conocida la relación entre el desenvolvimiento de algunas libertades en la Constitución inglesa y ciertos Fueros pirenaicos [40]. Más recientemente Wohlhaupter estudió la aportación inicial española para el establecimiento de algunos de esos derechos individuales, en virtud del enérgico caracter de colonización que la Reconquista tuvo [41].

El panorama de la vida política que acabamos de contemplar no podría explicarse sobre la base real de unas relaciones feudales de hombre a hombre, de individuo a individuo ; necesitamos referirla a una verdadera comunidad, con propias formas de vida y de cultura, dotadas de un caracter pre-nacional. De aquí que en el siglo XII surja ya una obra, la llamada « Crónica Silense » para la cual la historia es el destino político de todo un pueblo, de una comunidad humana constituida en una forma de vida que le es peculiar. En relación con ello está toda la espléndida floración historiagráfica del siglo XIII — con Lucas de Tuy, Rodrigo Ximénez de Rada, etc. Alfonso X el Sabio reconocerá explícitamente al « pueblo » como un personaje histórico. Lo cierto es que a partir del siglo XIII esos pueblos aparecen siempre en la historia de Europa como específicas comunidades de caracter y así se encuentran ya citados la mayor parte de los pueblos actuales en la obra del canciller Diego García de Campos, « Planeta ».

Un rey preeminente y mayestático, apoyado sobre una comunidad política, históricamente afirmada, no constituye ciertamente algo que pueda insertarse en el sistema de un Sacro Imperio universal. En España, claro está, la existencia del Imperio europeo es conocida y también la formulación doctrinal de sus pretensiones de gobierno universal. Pero todo ello queda tan ajeno al pensamiento español que apenas se considera en la necesidad de rechazar tales doctrinas. El obispo-historiador Lucas Tudense, en el prólogo de su obra, declara que « Hispanorum

[40] De 1883—84 es el trabajo de WEBSTER *Influencia de los Fueros pirenaicos en la Constitución inglesa.*

[41] *La importancia de España en la Historia de los derechos fundamentales*, Madrid, 1930.

Rex nulli subditur imperio temporali » y, como manifestación de su « suficiencia », afirma la independencia jurídica de aquéllos : « in causis civilibus propriis utitur legibus » [42]. Pero antes que el Tudense, los canonistas españoles que trabajan en Italia mantienen ya plenamente un criterio de exención. En la valiosa investigación que Mochi Onori ha llevado a cabo sobre la aportación de los canonistas a la formación de la idea moderna del Estado, el papel de los españoles es decisivo. En las primeras décadas del XIII uno de éstos, Vicente Hispano, dá un paso definitivo ; hasta él, los comentaristas de la Decretal « Per Venerabilem », de Inocencio III, al llegar a la afirmación de que el rey « superiorem in temporalibus non recognoscit », habián dicho : « de facto » ; como sus predecesores, Vicente Hispano, al llegar a ese lugar del texto, citando a Juan de Gales, apostilla también « de facto », mas de su propia autoridad añade : « immo de jure » [43].

Respondiendo a este modo de ver, unos años después, Alfonso el Sabio, rey de León y Castilla, electo Emperador de Alemania, concebirá esta cuestión como un problema de política cuasi-estatal y se hallará dispuesto a cambiar el discutido Imperio Sacro-Romano, por un Imperio más positivo, sobre tierras peninsulares y norteafricanas. Pero Alfonso X pertenece ya a otra época.

Llegamos en nuestra exposición, aproximadamente, hasta mediado el siglo XIII. Ocuparnos de los últimos cincuenta años del período que se nos ha señalado, para llegar hasta alcanzar el 1.300, nos obligaría a entrar en una época cuyos supuestos espirituales, económicos, políticos, etc., son fundamentalmente diferentes y especialmente rico y complejo el pensamiento de la misma y sus escritores más representativos. Epoca de la baja Edad Media, en marcha hacia el Estado moderno, con sus universidades, su amplia burguesía, sus tendencias de crítica eclesiástica y social, sus reyes provistos de un fueste poder unificado, sus letrados que absorben las funciones públicas desplazando a los nobles, etc., etc.

Si, dentro de esa nueva época, penetrasemos en la corriente del racionalismo cristiano, espiritualista y reformador, tendríamos que ocuparnos ampliamente, por los menos de Raimundo Lulio. Al considerar el romanismo, con su tendencia al poder absoluto y a la democracia pre-nacional, nos encontraríamos la extensa obra de Alfonso el Sabio ; en el campo del aristotelismo científico (que en el XII dió, con Domingo Gundisalvo [44], la primera definición de la ciencia civil), a García de

[42] *Hispania illustrata*, IV, 3.

[43] Mochi Onori, *Fonti canonistiche dell'idea moderna dello Stato*, Milán, 1951, pag. 8.

[44] Sobre este precoz brote de aristotelismo político, ver la ed. del tratado de Gundisalvo, *De Scientiis*, preparada por el P. Manuel Alonso, Madrid, Escuela de Estudios Arabes, 1954.

Castrogeriz y otros ; en el movimiento de diferenciación y caracterización de los pueblos, tantas crónicas particulares, ricas de pensamiento político ; si tomáramos en cuenta la atención a lo empírico y real que en la nueva época se desarrolla y cuyo lema podría ser el aforismo de Pedro Hispano — « experimentum solum certificat » — tendríamos que recoger el concreto contenido psicológico de muchas máximas de los « espejos de príncipes » que todavía se seguirán escribiendo, etc., etc. Todo ello responde a la nueva mentalidad de una época, cuyos supuestos tendríamos que esclarecer hasta en lo que puedan conservar de la tradición, y que en cualquier caso es distinta de la que hasta aquí hemos considerado.

NOTES ON THE INTERACTION OF ENGLISH AND INDIAN THOUGHT IN THE 19th CENTURY *

Introduction

THE interaction of thought between India and England over the last two hundred years is an important chapter in the cultural history of the two countries which has yet to be studied in its complexity. With a few exceptions it has been all too easily assumed that England and more generally the West was the dominant partner in this relationship, and that the changes which resulted from it affected India only. This is an understandable misapprehension when one considers the striking material changes that have taken place in India in the last hundred years but these material changes should not blind us to the fact that more subtle changes have taken place in both countries. In this essay we are only concerned with the Indian side and that only during the 19th century. This was preeminently the period of European political and intellectual dominance it is true, but the impact of India upon European philosophers and poets and upon religious and ethical points of view began much earlier, was unabated during our period and became most apparent in the 20th century. The elements of mysticism or neognosticism in the works of such influential writers as Yeats, T.S. Eliot, Auden and Aldous Huxley stem explicitly from Hindu roots.

We cannot hope within the confines of a brief essay to do justice to the delicate inter-play of thought nor to gauge the precise influence of individuals at different historic moments of our period. All we can hope to do is to sketch out what seem to us to be the major features of the relationship during the 19th century, limiting ourselves to occa-

* Recommended by Dr. Louis DUMONT, Associate Author-Editor, Vol. V.

sional references to the years which preceded and followed it where such references illustrate or explain some feature of the period which is our particular concern.

Throughout the 19th century two opposed views of India's past and of her society prevailed both among the English and the Indians. On the one side was the view that any people might be expected to have of its past, that it was glorious and that the society which it had produced, sanctioned by time, was the best. The other view held that the wonders of India's history were the wonders of myth and that her society was corrupted by superstition and savagery. A. R. Desai, who has pointed out the relevance of these two views [1], tends to suggest that the conflict was between the extreme national-chauvinist Hindus on the one side and the arrogant imperialists, characterised by Macaulay, on the other. Macaulay inquired whether the British should 'countenance at the public expense medical doctrines which would disgrace an English farrier, astronomy which would move laughter in the girls at an English boarding school, history abounding with kings thirty feet high and reigns thirty thousand years long and geography made up of seas of treacle and seas of butter...' [2]

One of the purposes of this paper will be to show how these two views, sometimes in conflict, sometimes held in an uneasy balance, dominated Indian life throughout the century and how, so far from being the respective views of two races, were represented on both sides.

Closely related to these views are the two issues of education and nationalism. Presenting the matter in ideal form we can say that the early exponents of education in India, by which we mean here English education, were adherents to the second view, while the later nationalists are representatives of the first. But this having been said we are bound to qualify both statements. The reformers of the early years were not anti-nationalist nor were the later nationalists reactionary. Ram Mohan Roy (1772-1833), the dominating figure of the early years of our century, supported Macaulay in his struggle to establish English education and spoke of the old system of Sanskrit education in terms almost as derogatory. Opposing the establishment of a new Sanskrit College in Calcutta in 1823 he says :

> 'This seminary (similar in character to those which existed in Europe before the time of Lord Bacon) can only be expected to load the minds of youth with grammatical niceties and metaphysical distinctions of little or no practical use to the possessor or to society. The pupils will there acquire what was known 2,000 years ago, with the addition of vain and empty subtleties... If it had been intended to keep the British nation in ignorance of real knowledge, the Baconian

[1] Desai, A. R., *Social Background of Indian Nationalism* (Oxford University Press, Indian Branch, 1948), p. 121.

[2] Quoted, *Idem.*

philosophy would not have been allowed to displace the system of the schoolmen... In the same way the Sanskrit system of education would be the best calculated to keep this country in darkness, if such had been the policy of the British legislature.'[3]

But Ram Mohan Roy had no doubt that India was working towards her independence. In his youth he had learned to hate the British and his later admiration for their institutions and the teachings of Christianity never led him to accord with Macaulay's hope that a new society should be founded in India which would be Indian only by race and English in every other respect[4]. On the other hand the group of liberal Indians who formed the first Indian National Congress (1885) had little brief for the theory of past greatness and were concerned to establish a distinctively Indian modern nation. Indeed the founder of Congress, Mr A.O. Hume, a retired I.C.S. officer, hoped that it would combat the revolutionary notions of the time and by education and constitutional agitation produce unity and political consciousness. Educated Indians of the 1880's derived their education, for the most part, from the tradition established before 1850 and when we come to discuss nationalism in relation to the two views of India's history which we have noted, we shall have to venture a little beyond our period in order to establish our perspective.

We shall for the sake of convenience divide the discussion into two parts, the first will deal with the years up to the Indian Mutiny and the second with the Mutiny and the second half of the century. The foci of the sections will be education and nationalism respectively, a device which will serve so long as we bear in mind that the seeds of nationalism were sown in the earliest years, while ideas current then remained active throughout the century.

I

1800 - 1857

Although the political history of the years immediately before and after 1800 are the years of growing British dominance and expansion, the characteristic view of Indian society held by the English was that of interest and respect. This attitude survived from the earlier purely commercial interest. It was still untouched by imperialism or racialism. In 1684 the Directors of the East India Company had instructed their representatives as follows :

[3] Quoted O'MALLEY, L. S. S. (editor), *Modern India and the West* (Royal Institute of International Affairs, Oxford University Press, 1941), p. 485.

[4] DESAI, *op. cit.*, p. 130.

'The soldiers' wives shall come to their Husbands, if they can find means to satisfy, or pay the owners for their passages, and for such soldiers as are single men, if you could prudently induce them to marry Gentues (i.e. Hindus), in imitation of the Dutch polliticks, and raise from them a stock of protestant Mestizees (Eurasians).'[5]

Improved communications and an increase of population reduced large scale inter-marriage between the races during the last years of the 18th century, but apparently social relations between the two races were conducted on terms of equality and it is only in the 19th century that the English community began to consolidate itself and to exclude Indians from its more general social life. In accordance with the earlier respect for Indian culture Warren Hastings had founded a centre of traditional Islamic learning in Calcutta in 1781 and the Resident of Benares founded a Sanskrit College there in 1792. The latter decades of the 18th century saw the first translation into English of the Bhagavad Gita, the Code of Manu, the foundation of the Asiatic Society of Bengal by Sir William Jones, the discovery of Sanskrit drama and the translation of Sakuntalā, which, when later translated into German, so impressed Gœthe. This movement produced in the first decade of the next century Duperron's translation of selections from the Upanishads (1802) of which Schopenhauer said 'It has been the solace of my life, it will be the solace of my death' ; Colebrooke's Sanskrit grammar based on Pānini (1805) ; Schlegel's 'Language and Wisdom of the Indians' (1808). If, as we shall see, sympathy for Hindu philosophy and literature later temporarily declined amongst the English in India, it was on the increase in Europe and particularly in Germany throughout our period.

But England of the early 19th century may be characterised as a missionary country in every sense of the word. To point the change that had taken place we may describe the experience of William Carey, one of the founders of English education in India. In the 1780's he had suggested at a meeting of Baptist ministers that it might be 'the duty of Christians to attempt the spread of the Gospel among the heathen nations' and had been rebuked by a senior with the words : 'Young man, sit down. When God pleases to convert the heathen he will do it without your aid or mine.'[6] The East India Company had prevented the entrance of missionaries before 1813 but in that year Parliament, renewing the Company's charter, made it a condition that missionaries be allowed to go out 'under licence'. But England in the 19th century was more than missionary in religion and although it had not yet

[5] Cumming, Sir J. (editor), *Political India, 1832-1932* (Oxford University Press, 1932), p. 148.

[6] Quoted Thomas, P., *Christians and Christianity in India and Pakistan* (Allen and Unwin, 1954), p. 151.

reached the height of imperialistic exuberance, the spirit of Cecil Rhodes, the hope for the 'extension of British rule throughout the world... the foundation of so great a Power as to hereafter render wars impossible and promote the best interests of humanity', was already in the making and is foreshadowed by the attitude of Macaulay.

The effects of this spirit in Bengal where Carey had established his mission school in 1799 and where Ram Mohan Roy, already influenced in favour of English education, was one of the founders of the famous Hindu College, may be imagined. The same confidence in progress and what Tennyson later called 'the march of mind', began to spread.

Until 1813 when the East India Company's charter came before Parliament for renewal, educational activity in India had been of a private nature. Apart from the work of Carey and the Hindu College, the foundation of Warren Hastings and the Sanskrit College of Benares adhered to traditional methods and satisfied themselves with the traditional teaching. Explicitly the aim of the Sanskrit College was :

> 'the preservation and cultivation of the laws, literature and religion' of the Hindus 'at this centre of their faith and common resort of all their tribes.'

In 1813 Parliament stipulated that the Company take measures 'for the introduction of useful knowledge and religious and moral improvements'. Precisely what was to be the nature of this government sponsored education raised a famous controversy in which Englishmen and Indians were ranged on both sides. The parties have been characterised as the 'Orientalists' and 'Anglicists', names which correspond respectively to our division between the two views of Indian history and society.

Company officials were slow in putting Parliament's proposals into practice. A standing committee to consider the matter was not set up until 1823 and put in charge of a yearly grant of one lakh of rupees. In the first days of its existence the committee veered towards the 'orientalist' position. It not only considered that instruction in European sciences was 'neither among the sensible wants of the people nor in the power of Government to bestow', but also decided to found a new Sanskrit College in Calcutta in 1823. It is at this point that we have the clear emergence of an Indian opinion on the subject. While the 'Orientalists' were in favour with Hindu and Muslim orthodox groups, a small but vocal group of Indians in Bengal was on the side of the 'Anglicists'. We have already quoted a part of Ram Mohan Roy's objection to the encouragement of Sanskrit education. He continues :

> 'As the improvement of the native opinion is the object of the Government, it will consequently promote a more liberal and enlightened system of instruction, embracing mathematics, natural philosophy, chemistry and anatomy with other useful sciences, which may be accomplished with the sum proposed by employing a few gentlemen of talents and learning educated in Europe, and providing a college furnished with the necessary books, instruments and other apparatus.'

Admiration for the things of western science and culture did not at that period carry with it the stigma of 'westernisation'. Ram Mohan Roy looked forwardly confidently to the independence of his country as an inevitable step in the evolution of society. In this expectation he merely represented enlightened Indian and English opinion of future progress. As early as 1820 we find the *Indian Gazette* assuming that 'the separation of India from Great Britain cannot in the nature of things be prevented'[7]. Sir Charles Trevelyan[8] in his *Education of the People in India* held, once more 'in the nature of things', that there could be no permanence to the English dominion in India but that, as a result of education, 'the change will... be peaceably and gradually effected ; there will be no struggle, no mutual exasperation ; the natives will have independence after first learning how to make good use of it ; we shall have exchanged profitable subjects for still more profitable allies.' In both East and West this was the liberal opinion. In 1833 the education question was firmly settled in favour of the 'Anglicists'. The appointment of Lord William Bentinck was the triumph of the missionary mood of England. It is not for nothing that the Government of India Act for 1833 was preceded in 1832 by the great Reform Bill and was accompanied in the same year by the Act which formally abolished slavery. The appointment of Bentinck was followed in 1835 by the decision of the standing committee on education in favour of the promulgation of European literature and science in India. Since this decision expressed the desire of leading Indians as much as of Englishmen it is wrong to imagine that Macaulay's minute played a decisive part but, as has been well said, it did at least 'crow up the dawn'[9].

Ram Mohan Roy left India to visit England in 1830 and he died there in Bristol in 1833. Any discussion either of the movement of thought in India or of the major reforms introduced in the first thirty years of the century needs a more detailed consideration of him, as a representative figure, than we have given so far. At an early age he came under the influence of Islam and particularly of the *Sufi* school.

> 'Throughout his subsequent life, (he) never entirely shook off these early Mahomedan influences. In private life, through a long course of years, his habits and tastes were those of a Mahomedan.'[10]

He came into contact with Englishmen shortly after the turn of the century and was employed by the Company until 1814 when he retired to devote his life to study and the social and religious life of his country.

[7] MAJUMDAR, B., *History of Political Thought*, Vol. I — *Bengal* (Calcutta University, 1934), p. 13.
[8] Quoted O'MALLEY, *op. cit.*, p. 743.
[9] *Idem*, p. 149.
[10] Siva Nath SASTRI, quoted FARQUHAR, J. N., *Modern Religious Movements in India* (Macmillan, New York, 1919), p. 30.

From Islam he had acquired a form of monotheism and a critical attitude to the idolatry and many other customs of his fellow Hindus. Of European authors he came under the influence of Montesquieu, Blackstone and Bentham. There is a suggestion that towards the end of his life he became interested in the revolutionary movements in America and Europe but, in the main, his efforts were governed by liberal principles unaffected by a more specific nationalism. Thus W.C. Wordsworth describes his participation in the agitation for freedom of the press in 1823. The petition to the Supreme Court of Calcutta was drafted by him and has been described as the Areopagitica of Indian history ; it was signed by him and five other notable Indian liberals :

> 'all men remembered by Indians as brave patriots who dared to stand up to Company, government and court, not on behalf of any peculiarly Indian rights, but on behalf of what they and their admirers regarded as a natural right of all men, the free access to knowledge and opinion without the intervention of any authority to say what was good for them, what not.' [11]

If in his concern for the freedom of the press he may be described as a liberal without qualification of race, he was no less so in his support of reforms introduced by the British once the old policy of laissez faire had been rejected.

It is in the field of religion that Ram Mohan Roy is most well known to Europe and it is there that his liberal education is most apparent. Thus he wrote in 1828 :

> 'I regret to say that the present system of religion adhered to by the Hindus is not well calculated to promote their political interest... It is, I think, necessary that some changes take place in their religion at least for the sake of their political advantage and social comfort.' [12]

This view is no less remarkable in its content than in the manner in which it is expressed. This cool presentation of utilitarianism was never to be so explicitly put forward in India again but its effects may be noted throughout the century. In his own religion Ram Mohan Roy insisted upon calling himself a Hindu but he was nevertheless explicit in his debt to Islam and to Christianity. Referring to the latter the distinctive liberal note is again apparent :

> 'I have found the doctrines of Christ more conducive to moral principles, and better adapted for the use of rational beings, than any other which have come to my knowledge.' [13]

The Brahmo Samaj which was the result of his work has been described by Mayhew as 'doctrinally similar to Victorian Unitarianism' [14].

[11] O'MALLEY, *op. cit.*, p. 198.
[12] MAJUMDAR, *op. cit.*, p. 9.
[13] Quoted FARQUHAR, *op. cit.*, p. 32.
[14] O'MALLEY, *op. cit.*, p. 314.

Although later religious reformers were more concerned with a return to what was conceived of as the pure and original form of Hinduism, the awareness of the monotheistic possibilities of Hinduism and the introduction of Christian ethics have survived and neo-Hinduism has been shaped largely by Ram Mohan Roy.

After his death a new note creeps into the political writings of Indians. The period of liberal reforms and the introduction of English education had not brought with it a greater association of Indians in the government of their country. At the same time the increase of the English population and consequent self-sufficiency combined with a growing sense of racial superiority, were drawing the two communities apart.

It is an ironic commentary on the belief in the 'march of mind' that it encouraged our colonial dependents to hope for equality, while ultimately producing at home an arrogance that could scarcely conceive of such a thing. The English parliament approved the introduction of English education into India in 1833 but a proposal that British India might have four representatives in the House in 1831 'was greeted with laughter in the Commons' [15].

Ram Mohan Roy had never spoken of 'natural rights' in the sphere of politics and disapproved the more radical views of his followers. He followed with sympathy the nationalist movements of Europe but did not base his doctrine on the doctrines of those movements. Rather he held that 'if an era of liberalism and nationality dawned upon Europe, *the logic of history* would carry the liberal movement to India in due course' [16].

Although Ram Mohan Roy disapproved of radicalism, radical notions were associated with his from the earliest days. David Hare, 'the illiterate but philanthropic watchmaker', and Derozio, teacher at the Hindu College from 1828 until his death in 1831, drew their inspiration from the political movements of continental Europe. Readers of Rousseau, Hume and Paine they looked out to the French revolution and to the work of Mazzini in the Italy of their day. A whole generation came to have the experience of patriotism. How powerful was the effect of Derozio's appeal to patriotism may be seen from the evidence of Brahmabaddhab Upadhyay. He records the reaction of the students to the lectures of Surendranath Banerji in the 1870's.

> 'Surendranath would often ask during his lectures :
> "Who among you will be a Mazzini, a Garibaldi ?" And we would all clap enthusiastically and cry "All ! All !" ' [17]

[15] MAJUMDAR, *op. cit.*, p. 45.
[16] *Idem*, p. 22. Our emphasis.
[17] ANIMANANDA, B., *The Blade — Life and Work of Brahmabaddhab Upadhyay* (Roy, Calcutta), p. 18.

The teaching of Ram Mohan Roy dominates the whole 19th century but the distinctive 18th century Benthamite tone together with explicit eclecticism in religion were soon to give way to the demands of nationalism. His impact was such, and it is the impact of Europe, that no future reaction against English power or English thought could exclude these very things from entering in to the reaction itself. Ram Mohan Roy had discovered England for himself and had chosen to enter it. The generation which grew up in the years immediately before the mutiny, grew up into an Anglicised world whose ideals they regarded as theirs by right.

II

1858 - 1900

Whether or not there was an idea of the 'state' in pre-British India, whether or not there was a nationalism, have been much argued. The tendency on the part of European writers to insist that both were entirely the product of European thought has produced a natural reaction on the part of some Indian authors. Varma's recent analysis of ancient Hindu political concepts shows that the vedic term *rashtra* cannot be taken to mean state in the sense that it is used today in modern India but, as he points out, the evidence of such political structures as the Asokan empire should warn us against over emphasising the fissiparous tendency of the caste system [18]. Chaudhuri, discussing nationalism, argues that a deep xenophobia is to be observed underlying the outward acceptance by Hindus of foreign domination throughout their history [19].

In this section we shall concern ourselves simply with the nature of the nationalism of the 19th century which preoccupied leading thinkers in India. We have chosen the year of the mutiny because it does mark the beginnings of active nationalism. Chaudhuri, born in Bengal in 1897, notes how the mutiny has come, in certain quarters, to be regarded as the first war of Indian independence :

> 'I have watched the growth of the legend... in my own life. When I was a boy I first heard and then read many stories about the mutiny which had taken shape in the previous forty years... I particularly remember a sensational and lurid, and of course distorted account of the siege of Lucknow in a book in Bengali called the *River of Blood*.' [20]

[18] VARMA, V. P., *Studies in Hindu Political Thought and its Metaphysical Foundations* (Journal of Bihar Research Society, 1952-53), p. 11 *et seq.*

[19] CHAUDHURI, N. C., *The Autobiography of an Unknown Indian* (Macmillan, 1951), p. 399 *et seq.*

[20] *Idem*, p. 431.

But although there is little evidence that the leaders of the mutiny had any ideas of liberating their Motherland as such, in a deeper sociological sense we are justified in seeing here the point of departure for nationalism. Previous wars in India had been conducted as between polities of equal status if not equal power. The very word 'mutiny' was ascribed by the British and shows sufficiently that this uprising was regarded by them as a challenge to their status as governors of India. Finally it was a challenge with a large basis of popular support as a result of causes noted as early as 1833 by O'Connell [21]. From the times of Warren Hastings up to the mutiny we may say that England was moving from the position of being a dominant power to that of being the dominating power. It is significant that the mutiny was followed immediately by the formal assumption of power by the English crown.

There are, basically, two patterns of nationalism in India of the 19th century which we may characterise respectively as liberal and, following Desai [22], 'national chauvinistic.' It should be noted that we are dealing here with two ideal types not with historical action. The actions and motives of any one individual or group show, when analysed, a mixture of both types. Furthermore there is a distinction to be made between religious and political action. Those who were liberals in politics were often national chauvinistic in religion, while the most violent of revolutionaries at the end of the century were agnostic or atheistic in the liberal western manner.

Before considering the interaction of thought in the latter half of the century we must first of all establish our perspective by a forward glance. This can best be done by the juxtaposition of two events in the lives of religious leaders at the beginning of the century and at the end of it. In 1830 Ram Mohan Roy visited England to study English social life at first hand in order to benefit his own people by a closer emulation of western ways. Twice in the 1890's Swami Vivekananda visited England and America, not to see what India might learn from the West but to tell the West what it might learn from the religion of the Hindus. Have we to do here with a simple reaction? Two observations have to be made about Vivekananda's mission. Chaudhuri has drawn attention to the 'fugitive passage in his writings, very wistful in its involuntary slip from the consciously held theory' of belief in India's history;

> "Can you make a European society with India's religion?
> I believe it is possible and must be." [23]

The second point we also owe to Chaudhuri who shows that not merely Vivekananda but also Rabindranath Tagore only received the

[21] *Cobbett's Register*, Vol. 82, no. 3.
[22] *Op. cit.*
[23] CHAUDHURI, *op. cit.*, p. 489.

adulation of the masses in India when they had received the stamp of European approval.

> 'Vivekananda records : "I travelled twelve years all over India, finding no way to work for my countrymen, and that was why I went to America." His country welcomed him back as a great Hindu only when the Parliament of Religions at Chicago had given him an unexpectedly favourable reception.' [24]

The very fact that Vivekananda should have received such a reception abroad is a mark of the action of Hindu thought on the West which had progressed throughout the century and of which the Theosophical Society is the most famous and obvious result if not the most subtle. Here we are concerned to point out that the Hinduism which Vivekananda preached was the self-conscious Hinduism of an intelligentsia which had on the one hand absorbed ethics and apologetics from Islam and Christianity and on the other was concerned to present itself, for the first time in the religious history of India, as a world religion in opposition to others.

This development of Hinduism in the 19th century into a national and then world religion closely associated it with politics. Nevertheless we may, for our perspective, point to one specifically political fact which occurred shortly after the close of our period. In 1907 the Indian National Congress met in Surat and the meeting broke up in disorder as a result of a cleavage between two parties, the liberals and the extremists. Representative of the former party is Gokhale, representative of the latter is Tilak. Tilak and his followers had developed the liberal revolutionary line of thought to a point that violently conflicted with the more immediate descendants of Ram Moham Roy who still had faith in reform and independence by constitutional methods. It is a matter of history that Gokhale, succeeded by Gandhi, represented the future, although with Gandhi nationalism underwent significant changes in the 20th century which are not our concern here. We may return to Chaudhuri for the characterisation of our perspective :

> 'By far the greater majority of Indians rejected the idea of a synthesis of the civilisations of the East and the West... even when the synthesis was a living historical force... What Indians in the mass want is nationalism, which does not however preclude a wholesale and uncritical acceptance... of Western habits of living and economic technique. This is not as inconsistent as it might sound, for the concept of nationalism has been working against the concept of synthesis on the conscious plane while the absorption of the Western trends has been taking place on the unconscious (plane).' [25]

In the remainder of this essay we can only note the various factors which brought about this state of things at the end of the 19th century.

As a typical and well-known example of national-chauvinism in religion we may examine the sect known as the Arya Samaj. The founder

[24] *Idem.*
[25] *Idem*, p. 488.

of this sect, Swami Dayananda, was born in 1824 and was educated in the traditional Sanskritic method. Like Ram Mohan Roy, however, his early religious background turned him against idolatry [26]. He started out in life as a wandering ascetic and in 1860 came under the influence of a Brahman teacher in Mathura who instilled in him a reverence for the Vedas as the fundamental basis of religious truth. From 1863 to 1872 as a result of having met Christian missionaries he attempted the foundation of Schools which were to propagate his religious reforms directed against superstition and social corruptions for which no grounds could be found in the Vedas. His fundamentalism remained unchanged in content throughout his life but it was significantly intensified. As a result of contact with Christians and members of the Brahmo Samaj between 1860 and 1870 he began to preach monotheism as the true Vedic belief. We may wonder whether, in fact, the whole question of monotheism opposed to polytheism is not, in itself, a peculiarly western preoccupation. In his methods Dayananda was influenced by the Brahmo Samaj in that he relinquished the use of Sanskrit in debate and preaching and turned to his own vernacular Hindi. His development from a traditional wandering ascetic to that of a modern religious reformer is economically illustrated by Farquhar who gives two popular pictures of him at two different stages of his life [27]. In the first he is seen sitting in the posture of meditation dressed only in a loin-cloth; in the second he is seen wearing a turban and the dress which he had imitated from the Brahmo Samaj—in turn imitated from the typical dress of the missionaries.

In 1874 Swami Dayananda published his *Satya Prakash* or Light of Truth. By this point in his life his desire to purify Hinduism of what he regarded as accretions had been joined by an equally strong desire to establish it as a national religion superior to all others. Although the *Satya Prakash* is not taken literally by his modern followers the book is nevertheless an extraordinary document of nationalism. Whereas the school of religious reform which we have called liberal was essentially eclectic, Dayananda's teaching involved bitter attacks upon Islam and upon Christianity. Nor would he allow the West any supremacy in material civilisation. The inventions and discoveries which had made England so powerful in his time had been, he maintained, anticipated by the Vedas:

> 'All marvellous discoveries and inventions of modern times, all principles and conclusions of modern physics, chemistry, biology and engineering, are stated in the Vedas only if one knew how to interpret them appropriately.' [28]

[26] FARQUHAR, *op. cit.*, p. 104.
[27] *Idem*, facing p. 109.
[28] DESAI, *op. cit.*, p. 121.

The English had been able to make such progress only because they had stolen the sacred works and discovered their secret. In comparison with this fundamentalist view we may cite the critical attitude of members of the Brahmo Samaj in 1850 who, when the authority of the Vedas was questioned, sent out four independent students to study the Vedas in Benares and report upon them. Their reports were so diverse that the Vedas were rejected as a basis of faith.

Swami Dayananda founded his Arya Samaj in 1875. This Society of Aryans owed much to the Brahmo Samaj in its organisation and in its emphasis upon social reform, the abolition of caste and the anti-Brahman rules of its creed. The influence of western ideas can be best seen in the educational establishments which Swami Dayananda and later his Arya Samaj founded. The pattern of the student's daily life, his spiritual exercises, his dress, were modelled upon ancient Hindu rules but the content of his education, whatever might be said to be its origin, was western. Desai, discussing the question of reaction in education says of the Arya Samaj together with two other notable religious educational establishments, that they

> 'criticised the text books used in the government or missionary schools as promoting an attitude of depreciation of India's past... and have prepared and substituted different text books which would kindle national self-respect among Indians. However almost all of them have retained the essential core of modern education, its anti-authoritarian liberal note, its emphasis on individual liberty, its rejection of blind faith and stress on modern natural sciences.' [29]

It is significant from our point of view that the Theosophical movement worked in concord with Dayananda from its inception in India in 1879 until 1881. The Theosophical movement is properly a result of Hindu thought upon Europe but its arrival in India strengthened the nationalist movement. Despite the suspicion with which educated Indians regarded it, it was a confession of the superiority of Hinduism from exactly that quarter about which Hindu reaction was most sensitive. The vindication of this juxtaposition may be seen, if we go a little beyond our period to the political movements in India during the 1914-18 war. At that time Mahatma Gandhi sided with the liberals in trusting the British government, and supported Britain in the war. Mrs Besant, the leader of the Theosophical Society, sided with the militant nationalist Tilak in seeing the war as the great opportunity for renewed agitation for complete independence.

The mention of Tilak at this point provides a convenient opportunity for a discussion of the national-chauvinistic element of 19th century politics. His contribution to the movement is the closer association of religion with politics. As a Maratha he was able to appeal to the discontent of his people which had not subsided since the last Anglo-

[29] *Idem*, p. 127.

Maratha war of 1817-19. Although Tilak worked with the famous liberal moderate leader Gokhale in many reformist enterprises, the nature of his appeal was distinctly national-chauvinistic. He revived the celebrations in honour of the god Ganesh, a favourite of the Marathas and a figure of the all-India Hindu pantheon, and said of this revival that it not merely afforded an outlet for religious zeal but also could be made, with the use of lectures, processions and singing parties, a 'help in fostering the national sentiment ... and creating interest in the outstanding questions of the day' [30]. Even more significant was his development of the cult of Shivaji, the Maratha leader, as an Indian national hero. The uneasiness of this revival may be observed even in modern India. The educated consciousness of history can only present Shivaji as a local and tribal leader opposed to Muslim rule, but the need for nationalism to represent history inevitably conflicts with this. Shivaji in the late 17th century and the Rani of Jhansi during the mutiny can only be presented as national heroes by a kind of mythic history which cannot be allowed to approach the level of true historic consciousness. More powerful, because less impugnable, was the simultaneous worship in Bengal of the goddess Kali as mother of all Hindus.

Repression by the British government and the continued spread of education discountenanced the more violent forms of national-chauvinism but they introduced, as we have suggested, a line thought which ultimately modified the liberal school. Particularly in Bengal a highly educated class had arisen by the end of the 19th century which, even in the violence of its nationalism, vindicated Macaulay's claim made in the 1830's. Their nationalism, whether revolutionary or constitutional, was distinctively western. Even where there was a strong religious element, that religion had been passed through the filter of western concepts. An extreme example of this westernisation is Shri Aurobindo Gosh (1872-1951) whose father had sent him to England at an early age and had deliberately isolated him from his own people and language, so that when he returned to India it was as a foreigner. The Hinduism which he discovered and advocated was by that time a world religion and eclectic, if unconsciously so, in its ethics, belief and mysticism. Bengal was unable to offer to the great masses a nationalism which could be reformist and constitutional in its methods and at the same time deeply popular. The man who was to combine these necessary requirements was of course Mahatma Gandhi.

Although Mahatma Gandhi is thought of as a twentieth century figure we may nevertheless examine briefly his formative years. He tells us how in England of the late 1880's he played at being an 'English gentleman' and how he discovered the religious literature of his country

[30] *Idem*, p. 305.

in English translations [31]. His appreciation of some aspects of Christianity began at the same period and lasted throughout his life. Although his case is less extreme than that of Shri Aurobindo his political discovery of India does not begin until 1901 when Sir Pherozeshah, in reply to Gandhi's request for action on behalf of Indians in South Africa, points out to him; "But what rights have we in our own country ?" [32] Later in his life he was to develop his idea of *Ramraj*, the period in the past when India had been perfect and to which it might return. In this aspect of his complex character he represents that line in national-chauvinism which is exemplified by Dayananda. In the years which he spent in South Africa his more immediate debt was to Tolstoy and to Ruskin :

> 'Three moderns have left a deep impress on my life, and captivated me : Raychandbhai by his living contact ; Tolstoy by his book *The Kingdom of God is within you* ; and Ruskin by his *Unto this Last.*' [33]

And speaking of the latter work he says :

> 'The book was impossible to lay aside once I had begun it ... I determined to change my life in accordance with the ideals of the book.' [34]

His first foundation, the beginnings of what were to be his famous *ashrams*, was called Tolstoy Farm and his use of passive resistance he derived in part from Tolstoy [35]. That European writers should have been found so sympathetic at the end of the 19th century is a result of a dual process. On the one side is the rationalisation and generalising of Hinduism in India and on the other the modification of western thought by Hinduism and other eastern religions which had gone on throughout the period. Parallel to the differing motives with which Ram Mohan Roy and Swami Vivekananda visited the West we may juxtapose the meeting between Ram Mohan Roy and Bentham in England in the 1830's [36] and the correspondence between Mahatma Gandhi and Tolstoy in the first decade of this century [37].

Although the major developments of Mahatma Gandhi's life took place in the 20th century he was a product of the 19th and in this shares with all the leading figures of the last stages of the nationalist or independence movement. Future historians may justifiably regard the years 1857 to 1947 as being one connected period of India's history. It is only in the generation now growing up that modern India comes to emancipate itself from the 19th century.

[31] GANDHI, M. K., *Autobiography* (Navajivan Press, 2nd edition, 1940), Chs. XV and XX.
[32] TENDELUKAR, D. G., *The Biography of Mahatma Gandhi* (Times of India Press, 1951-54), Vol. I, p. 63.
[33] GANDHI, *op. cit.*, p. 114.
[34] *Idem*, p. 364.
[35] GANHDI, *Satyagraha*, Chs. XIII and XXXIII.
[36] MAJUMDAR, *op. cit.*, p. 18.
[37] TENDELUKAR, *op. cit.*, Vol. I, pp. 147-151.

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EFFECTS ON INDIA OF BRITISH LAW AND ADMINISTRATION IN THE 19th CENTURY *

In two previous issues of the *Journal of World History* (Volume I, 4 and Volume II, 1) Dr. N. V. Sovani has written on the "British Impact on India" in the 19th century. The present paper is not a repetition of the same theme, its scope being sufficiently indicated by its title. While Dr. Sovani has discussed in a general way the total extent of the British impact on India, with special emphasis on the economic sector, the scope of the present paper is more limited, being confined to the impact in respect of Law and Administration. The paper has been divided into five sections : (1) the structure of administration ; (2) land-tenure ; (3) judicial organization ; (4) codification of laws ; and (5) the new system of education.

I. *THE STRUCTURE OF ADMINISTRATION*

Salient Features. Analysis of the structure of administration reveals certain salient features, the first being an increasing tendency towards centralization which started with the Regulating Act of 1773 and which was accelerated with each successive re-organization until the second half of the 19th century when no further tightening of the screw was possible. Only then was a reverse process initiated out of sheer necessity.

The second important feature was the tendency towards enforcement of a rigid uniformity. This is best illustrated by the removal of the original difference between Regulation and Non-Regulation Provinces and by the establishment of a uniform pattern of district administration throughout the country. The same force was behind the reform of the judicial organization and the codification of laws.

* Recommended by Dr. Louis DUMONT, Associate Author-Editor, Vol. V.

Another feature was the attempt to establish democratic control over the administration through parliamentary interference in Indian affairs. Although the administration was not responsible to the Indian people for its policies and actions, it could not develop into an absolute despotism because it was responsible to the British people through Parliament. The advance of democracy in Britain in the 19th century naturally produced a sobering effect on the Indian administration. As long as the East India Company retained its power, Parliament maintained a critical and watchful attitude. Whenever the Company's Charter came up for renewal, Parliament held a thorough enquiry into Indian affairs and tightened its grip on the Indian administration through the President of the Board of Control. After 1858, Parliament's interest in Indian affairs apparently declined, but this was really due to the fact that Parliament was conscious of its effective power over the Indian administration and knew that it could be exercised whenever required.

Finally, it may be noted that there was an attempt to maintain a system of checks and balances in order to prevent undue concentration of authority. Thus down to 1858 there was a careful division of authority in Britain between the Court of Directors and the President of the Board of Control, and after the transfer of power to the Crown, the Secretary of State for India, unlike any other member of the Cabinet, was saddled with a Council. In India, too, the Governor-General and the Provincial Governors were provided with Councils, with a view to vesting authority in a Committee. Because of practical difficulties inherent in such a system, the Governor-General and the Provincial Governors were given the power of over-ruling their Councils when necessary, but this power was in fact rarely exercised, and rule by committee remained the basis of Indian administration.

Evolution of the Administrative System: Central and Provincial Governments.

Before discussing the effects of British administration it is necessary to outline the evolution of the system since the East India Company became a political power in India. The earlier organization of the Company was naturally that suited to a trading concern. Each principal commercial establishment, or Factory as it was called, was under the control of a President (later Governor) and a Council. There was no central authority in India with control over all the Factories, nor was there any interference on the part of the home Government. It was only after the Company developed into a great political power following the battles of Plassey and Buxar and the grant of the *Diwani* that the British Government began to look into the Company's affairs and assumed increasing control over its political transactions. A feeble beginning was

made by the Regulating Act of 1773 [1], by which the Company retained its authority to administer its Indian territories although all despatches relating to political matters were submitted to one of the Secretaries of State. In India the situation had already made the Company's government in Bengal much more important than the governments of Bombay and Madras ; and thus the Governor of Bengal was designated Governor-General (although still of Bengal) while the Governor-General and Council of Bengal were given a vague and practically ineffective power of control over the other two Presidencies.

It was Pitt's India Act of 1784 [2] which really started the process of transferring political power from the Company to the British Government which culminated in the Act of 1858. The Act of 1784 set up a Board to control the political transactions of the Company, but in practice, its power was exercised by its President, a member of the Cabinet, through whom Parliament could control the Company's administration in India. In India the power of the Governor-General and Council of Bengal over the other two Presidencies was made more definite. The Act of 1813 did not effect any change in the structure of the Indian administration [3]. The Company's monopoly of Indian trade was abolished, but it remained a political as well as a commercial organization until the Act of 1833, which abolished the trading privileges of the Company altogether and required it to close down all its commercial establishments.

When the Company's Charter came up for renewal in 1833, a bill was introduced to abolish its political power and to place India under direct Crown administration, which was prevented only by Whig jealousy of the Executive. Thus the administrative functions of the Company were preserved for another twenty years, although at the same time the Board of Control tightened its grip on Indian administration. The original bill contained a proposal which would have completely changed the administrative pattern in India, vesting entire authority in the Governor-General and Council and suppressing the Provincial Governments altogether [4]. In the end this proposal was rejected and the Governor-General and Council (now significantly designated Governor-General and Council of India) were given the power of "superintendence, direction and control" over the Provincial Governments. In effect, this gave the Central Government ample authority to enforce its will on the Provincial Governments. In the sphere of legislation, however, the Act introduced complete centralization. The Provincial

[1] A. C. BANERJEE (Ed.), *Indian Constitutional Documents*, Vol. I, pp. 15-23.
[2] *Ibid.*, pp. 55-73.
[3] A. B. KEITH, *Constitutional History of India*, p. 127.
[4] *Cambridge History of India*, Vol. VI, p. 4.

Governments were deprived of their law-making power and legislative authority was vested solely in the Central Government [5].

The Act of 1853 [6] was intended to be transitional, to prepare for the time when it would be possible to transfer administration from the Company to the Crown. It considerably strengthened the position of the President of the Board of Control *vis-a-vis* the Court of Directors and it effected an important change in Indian administration by creating a legislative body distinct from the execution. Although consisting of a few senior officials and judges, this legislative body showed from the outset an independence of spirit that was quite disconcerting to the Governor-General and Council and also to the home authorities [7]. Another interesting result of the Act of 1853 was an increase in the importance of the Governor-General *vis-a-vis* his Council. The Councillors were now inclined to court the favour of the Governor-General for promotion to Lieutenant Governorship with a higher salary, and thus lost that status to which they had been previously entitled as members of the supreme administrative body in India [8].

The Act of 1858 was of great historical importance, as marking the end of the Company's rule and the transfer of the Indian administration to the Crown. It did not, however, effect much material change in the structure of administration, except what was a natural corollary to the transfer of power. The President of the Board of Control was replaced by the Secretary of State for India, while the place of the Court of Directors was taken by a new Council of India, a body so constituted as to ensure independent expression of opinion. Such a scheme, however, proved unworkable and, in 1869, the composition and powers of the Council were modified, and the Secretary of State obtained that independent control over Indian administration without which he could not have remained responsible to Parliament [9]. Another indirect result of the Act of 1858 was to increase London's control over Indian administration. The abolition of the division of authority between the Court of Directors and the President of the Board of Control, the higher political status of the Secretary of State compared to that of the President of the Board of Control, and the improvement of communications between Europe and India, particularly after the laying of the Red Sea Cable in 1870, shifted the centre of gravity of the Indian administration from Calcutta to London [10].

[5] Banerjee (Ed.), *op. cit.*, pp. 175-196.
[6] *Ibid.*, pp. 235-241.
[7] *Cambridge History of India*, Vol. VI, pp. 233-234.
[8] H. H. Dodwell, *A Sketch of the History of India (1858-1918)*, p. 50.
[9] *Ibid.*, pp. 25-30.
[10] *Ibid*, pp. 31-37.

The Act of 1858 did not make any material alteration in the structure of the government in India. But the same improvement of communications which was tightening the control of London over the Indian government, tightened the control of the Governor-General and Council over the Provincial governments, just as the control of the latter was tightened over the District authorities. There was also a substantial change in the position of the Governor-General in relation to his Council through a change in the procedure of work in the Council. The introduction of the portfolio system, permitted by the Act of 1861, reduced the scope of collective discussion by the Council, and the practice of the Governor-General holding separate consultation with a member of the Council and with the Secretary of the Department concerned made him the centre of the administration to a larger degree than before [11].

The same Act of 1861 which whittled down the power of the Executive Council, also curtailed drastically the power of the Legislative Council. After the events of 1857 it was necessary, as Bartle Frere urged, to have a barometer to study the state of popular opinion, meaning of course the opinion of the non-official European community in India and the English-educated Indian community [12]. The Secretary of State, Sir Charles Wood, agreed and the Act of 1861 preserved the Legislative Council, but only as a barometer. A non-official element was introduced no doubt and a few Indians were included for the first time, but the new body was merely an adjunct to the Executive, with no initiative or final control over legislation [13].

One significant provision of the Act of 1861 was the relaxation of legislative centralization made in 1833. Provincial legislatures were established on the pattern of the Central body [14]. This decentralization soon extended to other spheres, particularly finance and local government. The Act of 1833 which sought to achieve the maximum centralization of administration resulted in the establishment of a rigid control over Provincial finances by the Governor-General and Council. The first step taken in the reverse direction was by Mayo in 1870, when Provincial Governments were given some autonomy over certain heads of expenditure. It was extended by Lytton in 1877-1879 by the allocation of some minor revenue heads to the Provincial Governments. The demarcation of revenue heads between the Centre and the Provinces was completed by Ripon in 1882 and revised by Curzon in 1904 to the advantage of the Provincial Governments and with an assurance about the semi-permanence of the allocation [15].

[11] *Ibid.*, pp. 44-52.
[12] *Cambridge History of India*, Vol. VI, pp. 234-237.
[13] BANERJEE (Ed.), *op. cit.*, Vol. II, pp. 36-40.
[14] *Ibid.*, pp. 44-48.
[15] DODWELL, *op. cit.*, pp. 64-66.

English ideas spread rapidly among Indians, thanks to the new educational system, and from the beginning of the nationalist agitation in India in the latter part of the 19th century, the demand was raised for elected legislative bodies. It is significant that, however much such a demand alarmed British administrators, they could not altogether deny the rationality of its basis. Governor-General Lord Dufferin, while not favouring the idea of a Parliamentary government for India, nevertheless submitted in 1888 "a plan for the enlargement of our provincial councils, for the enhancement of their status, the multiplication of their functions, the partial introduction into them of the elective principle, and the liberalisation of their general character and political institutions" [16]. Thus the Act of 1892 increased the non-official quota in the Legislative Councils, introduced the principle of election, although not openly, and gave these bodies the power to discuss the annual budget and the right to put questions on the policies and actions of the Executive [17].

District Administration. It was at the District level that British administration was more thorough and effective than any administration in the past. In pre-British days the functions of the State were extremely limited, and these could be performed from the capital and the seat of provincial government. The District Magistrate and Collector of the 19th century was a civil officer, concerned with every aspect of the administration that touched the people. He was the all-purpose local agent of the Government. On the one hand, he was looked upon by the people as the symbol of governmental authority in the District, and on the other, the higher governmental authorities looked upon him as the principal instrument for the execution of their policies.

Under the British the first experiments in organizing an effective District administration were naturally made in Bengal because there the East India Company first acquired control over large territories. For the first few years after the grant of the *Diwani*, the Company was neither able nor willing to assume directly the responsibility of the new office, but left matters to be managed in the old way. This arrangement proving unsatisfactory, the Company started taking a direct interest in revenue collection and administration of justice, which was to result within a quarter of a century in the establishment of an elaborate system of District administration in Bengal, later extended with minor modifications to the rest of India.

The first step taken was the appointment in 1769 of British Supervisors in the Districts, who in 1772 became Collectors, with Indian *diwans* to assist them. They were mainly responsible for the collection

[16] *Montagu-Chelmsford Report*, paras. 67-68.
[17] BANERJEE (Ed.), *op. cit.*, Vol. II, pp. 106-110.

of revenue, but were also given judicial and magisterial powers. For the next twenty years various experiments were made in District administration—recalling the Collectors from the Districts in 1773, re-appointing them in 1781 with revenue functions only, and vesting them with judicial powers again in 1787 [18].

The character of the District administration was changed once more in the latter part of the Governor-Generalship of Cornwallis [19]. Cornwallis had a strong dislike for the concentration of authority in the hands of a single District officer. He wanted to emphasize the position of the judiciary and to make the Judge more important than the Collector in District administration. Thus it was, that under Cornwallis the Collector's function was limited to revenue matters only and the real head of the District administration was the District Judge.

In Madras the District administration followed the Bengal pattern down to 1818. After that, however, the definite acceptance of a different land-revenue system led to a change in the organization of District administration. There the revenue officer or Collector became the real head of the District. He was a magistrate and had the police under his control. The District Judge was confined to judicial work only. It is frequently asserted that the main difference between the Bengal and the Madras systems was that the former gave more importance to the judiciary and the latter to the executive ; the first was in the spirit of the British administration and the second in that of the Indian administration [20]. It is to be noted, however, that in Bengal the judge was also an executive officer, a magistrate and head of the police. It is more proper to say that in Bengal, after the introduction of the Permanent Settlement, the collection of revenue was of minor importance in District administration and therefore the Collector was made less important than the Judge-Magistrate. On the other hand, in Madras the *Ryotwari* system made the settlement and collection of revenue of greater importance in District administration and hence the Collector and Magistrate was made more important than the Judge. The Madras system was preferred by the Company's authorities and extended to other parts of India. Finally, in 1859 the Bengal system was modified to make the District administration uniform all over the country [21].

Besides the normal type of District administration, there developed another type in certain areas called non-Regulation Provinces as also in certain Districts of Regulation Provinces. It was characterized "by simple and more direct methods of procedure and by the greater accessi-

[18] *Cambridge Shorter History of India*, pp. 631-634.
[19] KEITH, *op. cit.*, pp. 106-109.
[20] *Cambridge Shorter History of India*, p. 645.
[21] *Ibid.*, pp. 707-709.

bility of the officials to the people ; but chiefly by the union of all powers —executive, magisterial and judicial—in the hands of the District Officer". This type of administration was just a mild version of military rule, deemed necessary for areas having a warlike population and recently subjugated by British arms or for some tracts in the other Provinces inhabited by backward tribes, to whom the normal type of impersonal and legalistic district administration was not quite suited. The distinction, however, gradually disappeared in the second half of the 19th century, partly because of an improvement in the state of law and order in the non-Regulation Provinces and partly because of the codification of laws and the introduction of uniform legal procedure throughout the country.

Local Government. In the sphere of local government, in towns and rural areas, a new pattern was evolved under the influence of British democratic ideas, but preserving all the same some amount of bureaucratic control, in conformity with the general system of centralized administration. In the past local government in India had centered on the village as a unit. In fact, the village council or *Panchayet*, as well as looking to purely local needs, had revenue, judicial and police functions, and as such was a vital part of the larger administrative framework. Under British rule, revenue, judicial and police duties were assumed by State functionaries. Thus the village council, deprived of its more vital powers, sank into complete unimportance and neglected to attend to its other duties as well. A vacuum was created in local government. When the British attempted to fill it by creating a new organization, they did not think of re-vitalizing the village institution but took the district and the town as the local government unit.

The system which grew up in a haphazard way was put on a more regular basis under Mayo in 1870. In the towns likewise, municipalities were organized in the third quarter of the 19th century, although not in a systematic way. In the three Presidency towns of Calcutta, Bombay and Madras, municipal government was at first entrusted to a number of justices of the peace. It was in the seventies that regular municipal councils were set up, with substantial quotas of members elected by the rate-payers [22]. The period of unplanned growth of local government came to an end with the formulation of a general policy under Ripon in 1882. The new policy aimed at two things : introducing the elective principle in the constitution of District Boards and municipalities and a considerable relaxation of official control [23]. Indians thus got an opportunity for political and administrative training in local government which was as yet denied to them in higher spheres. But in making the

[22] *Cambridge History of India*, Vol. VI, pp. 523-528.
[23] BANERJEE (Ed.), *op. cit.*, Vol. II, pp. 77-82.

District the unit of local self-government the new policy overlooked altogether the vitality and importance of the indigenous system which had continued through centuries, and created a system which was looked upon by the people as something artificial and not touching them quite so closely.

Multiplication of Functions and the Bureaucratic Machinery. The British Indian administration in the 19th century sought to pursue a much wider range of activities through direct State enterprise or indirect State intervention than any administration in the past. The reason lay not only in the difference in administrative ideals of India and the West, but also in the time factor. Due to change in ideas and material conditions, any government in the 19th century was bound to take in hand a much wider range of activities. Additionally the British Indian administration of the 19th century steadily pursued a policy of bringing India completely under Western influence, which it considered as synonymous with modernizing India. It sought to achieve this objective in a variety of ways—increasing the economic resources of the country, improving communications, spreading education (of the Western type), introducing new sanitary and public health measures, enforcing law and order, ensuring security of life and property, establishing a chain of law courts with uniform laws and codes of procedure, eradicating social evils, etc. The pursuit of these multifarious activities necessitated an ever-increasing elaboration of the administrative machinery and the setting up of new Departments, operating from the Central to the District level.

One of the principal achievements of British rule was the organization of a strong bureaucratic machinery, which, in fact, determined the character of the administration more than any policy laid down by the Company or the Crown. The centre of this bureaucratic machinery was the Civil Service. Its real beginning may be traced back to the days of Cornwallis, when servants of the Company entrusted with judicial, revenue and executive duties were debarred from private trade. In return they were compensated by higher salaries and the guarantee of an assured professional career, with the prospect of steadily moving up the ladder in order of seniority. Admission to the Service was by nomination till 1853, when patronage was replaced by open competition [24].

It is hardly necessary to emphasize the importance of this method of selection (to be adopted later for the British Civil Service also) in moulding the quality and character of the Service. It is true that the qualities of an administrator cannot always be judged by the result of a competitive examination. But taking a balanced view, it is difficult to conceive of any other system which can ensure better judgement in the selection of public servants. This is borne out by the experience of nearly every

[24] *Cambridge History of India*, Vol. VI, p. 16.

modern State. Then again, it is frequently asserted that by making recruitment dependent on a competitive examination in England and requiring a high degree of English education in the candidates, the new system had the effect of shutting out Indians [25]. But it may be observed that the exclusion of Indians was not the result of the institution of competitive examination. No Indian was appointed as long as the system of nomination lasted, and there is no valid reason to assert that if the system of nomination had continued, more Indians would have been appointed than the few who entered through open competition.

While keeping the higher ranks of the Civil Service in British hands, the Government sought to man the lower executive cadres with Indians. This led to the creation, first of the Statutory Civil Service in 1870 and the Provincial Civil Service in 1886. This structure (an Imperial cadre for Europeans and a Provincial cadre for Indians) was introduced in the other Services as well—Police, Medical, Educational, Engineering, etc. [26] One inevitable result of this system was the growth of a consciousness of superiority among English officers, who monopolised the Imperial Service.

Effects of the British Administrative System. One of the most striking results of British rule in India was the introduction of a dynamic force in administration. Previously there had been little essential change in administrative ideas and institutions. Shivaji's government in the 17th century might have suited any Indian ruler one or two thousand years before. A much greater difference lay between the governmental system under Warren Hastings and that under Lord Mountbatten on the eve of the transfer of power. Throughout the intervening period there had been continuous changes, constant enquiries into administrative problems and needs, constant expansion of governmental activities and constant elaboration or modification of the administrative machinery.

A fundamental feature of the British administration was its impersonality. The British administration "did not fundamentally change character with changes in Secretaries of State or Viceroys, and its strength and weakness at any particular time never depended on one man, as did that of all previous empires in India. It was in fact a machine which had to be tended, but the tempo or performance of which did not vary much with the mood or personality of the tender" [27]. This impersonal character gave the administration both its strong and weak points. On the one hand, it gave the quality of endurance ; on the other, it produced a lack of sensitiveness in the administrators to the feeling and desires of the people.

Thirdly, the essential basis of the British system of government was

[25] *Cambridge Shorter History of India*, pp. 702-703.
[26] *Cambridge History of India*, Vol. VI, pp. 361-368.
[27] Sir Percival Griffiths, *The British Impact on India*, p. 227.

civil, not military. Throughout the medieval period the State in India was organized on a military basis, and military and civil functions were combined in the same hands. The British brought with them their own ideas of government and not only kept the civil and military functions separate but always maintained the supremacy of the civil over the military authorities. The respect for civil government and its supremacy over the military branch, so essential for the healthy growth of the political life of any community, is one of the deep and lasting impressions left by the British administrative system.

Another important aspect of the British administration was that it was more thorough and interfering than any previous administration and thus pressed more heavily on the people. It was continuously expanding the scope of its activities and assuming new functions, many of which in earlier times would have been left to the people. The heavy pressure of this ever-expanding machine produced two demoralising effects. First was a sense of resignation to foreign rule, particularly after the Revolt of 1857, which did not wear off until the closing years of the 19th century. The second was a loss of initiative and an undue dependence on the Government.

British rule in India did confer some material benefits, and a few examples may be mentioned. The development of communications, the great networks of railways, telegraph and trunk roads, the construction of vast irrigation works, the improvement of agriculture, the development of India's natural resources, the establishment of large-scale industries, the introduction of progressive systems of commercial and industrial organization, the remarkable improvement in public health are some of the manifestations of the transformation that was taking place in the 19th century. It may be contended that this transformation was not the result of British administration but of new world conditions, the new economic and social forces radiating from the West. But the British administration must be given at least this amount of credit that it acted as the vehicle for the transmission of the new ideas from Europe and helped the operation of the new forces.

Much more important than these material benefits was the good that was done to India by the introduction of two peculiarly English ideas —rule of law and parliamentary government. The first had become so firmly implanted in the Indian mind by the middle of the 19th century that people could hardly conceive of any other principle of social organization. The idea of parliamentary government was introduced in the latter part of the 19th century, not with any conscious knowledge of where it would lead India to, but because of the instinctive belief of the British that it was the only natural form of political organization. At the same time the spread of English education was rapidly enlarging the group of Indians with faith in parliamentary government.

Another effect of the British administration was the unifying influence exercised by a centralized governmental structure and a uniform system of administration covering the entire sub-continent of India. The traditional unity of India was more cultural than political. Political unity in the real sense evolved under the impact of British administration, leading eventually to the modern conception of Indian nationhood.

British administration, however, had a demoralising effect on the national character as a result of the rigid 19th century policy of excluding Indians from all responsible administrative posts. On this point it will be better merely to quote the observations of Sir Thomas Munro in the early part of the 19th century. While discussing the benefits of British rule, Munro observed : "These advantages are dearly bought. They are purchased by the sacrifice of independence, of national character, and of whatever renders a people respectable... It is from men who either hold or are eligible for public life that nations take their character ; where no such men exist, there can be no energy in any other class of community" [28].

II. *LAND-TENURE*

The System under Hindu and Muslim Rule. One of the most fundamental changes wrought by British administration in India was in the sphere of land-tenure through the introduction of definite legal conceptions of rights relating to land. In ancient India the conception of land-tenure was not susceptible of that precise legal definition which a modern man would expect. What little precision there was, may be expressed in the following way ; the duty of the cultivator to cultivate his land ; the duty of the king to give him protection ; and the right of the king to demand and the duty of the cultivator to pay a certain portion of the produce of his land. Whether the king or the cultivator was the owner of the land, whether the payment of a part of the produce was a kind of tax to the State or a kind of rent for the occupation of land, were questions which never struck the ancients. Although there was no absolute limitation on the amount of State demand, custom had fixed it from one-sixth to one-fourth of the gross produce. The payment was in kind, but in the later Hindu period payment in cash was slowly beginning to appear.

Under Muslim rule there was practically no alteration in the system of land-holding, which fitted in perfectly with the Islamic principle whereby the State would give protection of life and property and freedom to pursue his normal avocation to a non-Muslim, subject to payment of

[28] Quoted from GRIFFITHS, *op. cit.*, pp. 231-232.

a tribute. Although the Hindu land-revenue system was retained under Muslim rule, in actual practice some important differences emerged. The State's share of the produce was substantially raised ; the assessment procedure was made more elaborate ; payment in cash became the normal rule ; and the task of collecting land-revenue was entrusted to intermediaries, assignees, farmers etc., except for brief intervals when the central government was strong and efficient enough to establish direct contact between the State and the individual cultivator.

The first Muslim ruler who attempted to re-organize revenue administration on a rational basis and to introduce clearer definition of land-rights through legal deeds like *kabuliyat* and *patta* was Sher Shah whose work was continued by Akbar. Under his successors the collection of revenue again fell into the hands of intermediaries with very wide but vague administrative powers in their areas. Secondly, his careful assessment procedure was replaced by a system of summary settlement ; and thirdly, the standard of assessment was raised from one-third to a half of the gross produce[29]. The result was the impoverishment of the peasantry and the decline of agriculture, particularly during the period of the dissolution of the Mughal Empire.

Land-Revenue Administration under the British. Such was the state of affairs inherited by the British when they received the *Diwani* of Bengal and Bihar in 1765. There had been for a long time no systematic assessment in these provinces, nor was there any satisfactory machinery to attempt one. Collection of revenue was entirely in the hands of a powerful class known as *Zemindars,* whose origin and exact status cannot be definitely ascertained. Some of the *Zemindars* might have been old local chiefs, with whom the Mughal Government had come to a settlement, leaving them in peaceful possession of their estates subject to the regular payment of revenue ; others might have been assignees or revenue-farmers who had gradually made their position hereditary with vague customary rights over their estates. By the 18th century the *Zemindars'* rights had become so well-established that if the revenue-settlement was not made with one of them, he was paid a share of the revenue known as *malikana* (or proprietor's share)[30].

British revenue administration began from the grant of the *Diwani* of 1765. But, as Kaye has observed, the Company's servants knew nothing of land-tenures. So out of necessity the Company entrusted revenue collection to a deputy *Diwan,* and for the first few years the old system, worked by the old officials, was retained. By 1769 the Company was beginning to realise not only the enormous losses it was suffering from the revenue management of the deputy *Diwan* but also the suffer-

[29] MORELAND, *From Akbar to Aurangzeb,* pp. 49-56.
[30] F. D. ASCOLI, *Early Revenue History of Bengal and the Fifth Report, 1812,* p. 34.

ings of the peasantry from the high-handed exactions of the *Zemindars*. From that time began a series of attempts to obtain first-hand information about revenue matters and economic conditions in rural areas. The first stage was the appointment of British Supervisors in 1769 in the different districts [31]. But their investigations did not bear much fruit, partly because the Supervisors were more interested in private trade, and partly because of the opposition of the *Zemindars* and revenue officials called *Kanungos*, who alone possessed the records containing the desired information.

The next stage started in 1772, following the declaration of the Company's intention "to stand forth as *Diwan*". Since the actual collections made by the *Zemindars* could not be known, it was decided to farm out estates by public auction to the highest bidder. The settlement made was for five years. The new policy soon proved to be unsatisfactory. In the first place, farming out estates to the highest bidders was not only a flagrant disregard of the customary rights of the *Zemindars*, it was also oppressive to the cultivators, since the revenue farmers were mere speculators and had no permanent interest in their estates. In the second place, while the intention was to ascertain the real value of an estate by farming it out to the highest bidder, because of reckless competition the highest bid was often more than the estate could bear [32]. This policy, however, continued until 1786 with minor changes. While these changes hardly improved the situation, it must be said to the credit of the foreign administration that it was conscious of its ignorance and constantly attempted to collect full information. In 1774 the Committee of Revenue instituted a careful enquiry and collected valuable reports from the districts [33]. Again, in 1778 the *Amini* Commission held an elaborate enquiry and brought out a comprehensive report [34].

In the Governor-General's Council, Francis first advocated a policy of making permanent settlements with the *Zemindars* [35]. The Court of Directors was gradually convinced of its utility, in view of the failure of short-term farming. When Cornwallis came in 1786, he carried with him the definite instructions of the Court of Directors to introduce Permanent Settlement [36]. He, however, found it necessary to collect further information about the revenue position and thus for two more years annual settlements were made. Then decennial settlements were

[31] *Ibid.*, p. 31.
[32] *Ibid.*, pp. 32-33.
[33] R. B. RAMSBOTHAM, *Studies in the Land Revenue History of Bengal (1769-1787)*, pp. 59-72.
[34] *Ibid.*, pp. 99-130.
[35] R. C. DUTT, *The Economic History of India under Early British Rule*, p. 59.
[36] *Ibid.*, pp. 81-82.

made with the *Zemindars* in 1789-90 which, with the approval of the Court of Directors, were declared permanent in 1793 [37].

For some years the Permanent Settlement was so much favoured by the authorities that persistent attempts were made to extend it to other possessions as well, even though the conditions there were markedly different. Then, in the early part of the 19th century, the influence of Munro led to the Permanent Settlement being considered a grave blunder. On the one hand, the Government was deprived of a proportional share of the increased profits of agriculture ; and on the other, the legal recognition of the hereditary proprietorship of the *Zemindars* without corresponding recognition of the rights of the tenants placed the latter in a more disadvantageous position than before. In the 20th century Indian politicians also, with the beginning of the era of self-government, began to attack the Permanent Settlement not only on grounds of financial loss to the State and hardships to the tenants, but also because of the supposed loyalty of the landed aristocracy to foreign rule.

It has to be admitted that the Permanent Settlement was introduced not so much because of its theoretical merits as because of its practical benefits in the situation which then prevailed. The immediate object was to bring to an end the period of confusion in revenue administration and establish a stable system which would at least ensure a fixed revenue for the State. The ultimate object was to promote agricultural prosperity by giving an incentive to the landlords in the shape of a fixity in State demand and legal recognition of their hereditary proprietorship of land [38]. So far as both these objects were concerned, the Permanent Settlement in the long run proved to be a successful measure. It is true that the immediate results were not wholly satisfactory, due to the excessive nature of the assessment. Under the Mughal system there was always a wide difference between theoretical demand and actual collection, and while great pressure was put on a defaulting *Zemindar* to pay, he was not ordinarily dispossessed of his land. Under the British system there was no laxity in collection and, thanks to the new "Sun-set law", the estate of a defaulting *Zemindar* was promptly put up for sale. Thus, in the first few years of the introduction of the Permanent Settlement a good part of the old hereditary aristocracy of Bengal was wiped out, replaced by adventurous speculators having no traditional link with the estate or sympathy for the tenants [39].

It was again the excessive assessment that was responsible for the hardships of the tenants and not any inherent cruelty on the part of the *Zemindars*. The laws of 1797 and 1799, which gave the *Zemindar* power

[37] *Ibid.*, pp. 93-94.
[38] ASCOLI, *op. cit.*, p. 73.
[39] *Ibid.*, pp. 74-75.

of distraint on the property of defaulting tenants, were the natural corollary of the "Sun-set-law". Cultivation extended and the price of agricultural products steadily rose in the 19th century, the burden of the land-tax became less oppressive and gradually the level of stability was reached, which proved beneficial to the *Zemindar* and the tenant alike [40]. Then as population increased, causing a keener competition for land and giving a sharper edge to the *Zemindar*'s power, the Tenancy laws of 1859 and 1885 were passed to protect the rights and interests of certain classes of tenants. The legal recognition of occupancy rights and the limitation of the *Zemindar*'s power of increasing rents prevented the evils which might have resulted from the Permanent Settlement under the changed economic conditions of the latter part of the 19th century.

In one sense, the history of Madras revenue administration is of greater interest, because there for the first time appeared a serious and prolonged controversy about the merits and demerits of the three principal land-systems prevalent in pre-British days—the *Zemindari*, the *Ryotwari* or peasant-proprietorship and the *Mirashi* or village community system [41]. In areas like the Northern Sarkars, where powerful chiefs existed, there was not much difficulty, and the Bengal system was introduced at the opening of the 19th century. But the typical Madras system, of which the originator was Thomas Munro, was based on direct settlement with the individual cultivator, who was recognised as the proprietor of his land. A third alternative, the village community system, in which the village was considered as a collective unit for the purpose of revenue settlement, was for a time strongly advocated by the Madras Government.

By 1820 Munro's ideas prevailed and the *Ryotwari* system was introduced everywhere, except where Permanent *Zemindari* Settlement had been made. Its ultimate result was the break-up of the old compact village communities. The *Ryotwari* system was favoured by the Company really because it yielded more revenue, and Munro's ideas about a moderate assessment and a permanent settlement were totally disregarded [42]. Thus it was that the benefit conferred by the British administration on peasant-proprietors by definite recognition of their rights through direct revenue settlement turned out to be of little practical significance, because of the excessive State demand, valued initially at half the gross produce and later at one-third. Moreover, there was no fixity about the State demand and assessment lay at the discretion of revenue officers every 30 years.

A similar system was introduced in Bombay. To be sure, Mountstuart

[40] Dutt, *The Economic History of India in the Victorian Age*, p. X.
[41] Dutt, *The Economic History of India under Early Bristish Rule*, pp. 135-152.
[42] Dutt, *The Economic History of India in the Victorian Age*, p. 78.

Elphinstone, who first organized revenue settlement in Bombay, had different ideas. His famous *Report on the Territories Conquered from the Peshwa* (1819) reveals his deep sympathy for the conquered people and an eagerness to maintain the old institutions of the country. Among these institutions, he noticed particularly the existence of well-organized village communities, with active and powerful village councils or *Panchayets*. Elphinstone's idea was to combine the *Ryotwari* and the village community systems [43], but this compromise plan could hardly work in practice. As the Government undertook the function of fixing individual assessment, the position of the village council was undermined, and in fact the village community system automatically disappeared in the face of the Government policy of opening direct relations with each cultivator. In Bombay, as in Madras, the main defects of the settlement were the excessive assessment and the uncertainty of the State demand following each periodical revision [44].

In northern India two kinds of tenure were prevalent, *Zemindari* and village community systems. In the early years of the 19th century there was a tendency to make settlements with the landlords on the Bengal pattern. But there came a change with the famous minute of 1819 of Holt Mackenzie, which revealed the existence of compact and well-organised village communities in northern India. Mackenzie recommended a settlement with these communities after a systematic survey and enquiry [45]. His idea was accepted by the Government in 1822 and settlements were made with landlords where they existed and with village communities where they held land in common tenancy. But in spite of the careful and elaborate survey work done by Bird and Thomason, the settlements in northern India proved unsatisfactory because of the excessive nature of State demand and the uncertainty faced by all at the time of the periodical revision of the assessment [46].

Effects of the Land-Revenue Policy. What were the effects of the revenue policy of the British administration on land-tenures and existing institutions and customs of the country ? The attempt to define and to codify inevitably resulted in partially changing the old pattern. Thus it was that the *Zemindar* under British rule was not exactly the same as in pre-British days. In some respects his position had improved, in others definitely weakened. Again, while the passing of the Tenancy laws in the 19th century improved the position of certain classes of tenants by clearly defining their rights, it weakened the position of others, not included in these categories, by indirectly depriving them of the customary rights they had enjoyed in the past.

[43] DUTT, *The Economic History of India under Early British Rule*, pp. 346-352.
[44] *Ibid.*, pp. 379-383.
[45] *Ibid.*, pp. 190-191.
[46] DUTT, *The Economic History of India in the Victorian Age*, pp. 43-48.

Perhaps the most unfortunate effect of the British revenue system was the slow death of the village communities, which had preserved their existence all through the ages and which constituted the most remarkable feature of Indian social structure.

Another way in which the British revenue system affected the people was in the imposition of a burden on the agricultural class far heavier, in actual practice, than under any previous administration [47]. The British administration sought to rationalize the revenue system by instituting a very elaborate and careful process of field survey and individual assessment, but the net effect was to increase the burden of taxation to a degree exceeding the rapacity of even the most powerful ruler in the past.

III. *JUDICIAL ORGANIZATION*

Difference between the British and the Earlier Systems. Perhaps in no other sphere has the impact of British rule been more evident to the common people and more fruitful for the orderly development of India into a modern State than in the sphere of law and justice. The British system differed from the earlier systems, Hindu and Muhammedan, both in the nature of law and in the administration of justice. The Hindu law was inseparably mixed up with religion. "In the first period the *Srutis* or the *Vedas* were the only authority. Then in the second or *Smriti* period Manu and other *Rishi* commentators were authorities *per se*... In the third period commentaries such as the *Mitakshara, Dayabhaga,* etc. appeared and became books of authority" [48]. The Hindu law system was not necessarily static, as is sometimes erroneously held, but its interpretation was entrusted to religious commentators of the priestly class rather than to the State.

Muhammedan law also was essentially bound up with religion. The source was the Quran, though in later days there was much legal development through Commentaries upon that book and the collection of traditions that had grown up round it. Its interpretation and development was likewise in the hands of ecclesiastical scholars.

Under the British the development of law became the function of the State. There was a self-imposed check on this legislative authority where the personal laws of Hindus and Muslims were concerned, but even in that sphere large inroads were made from time to time. In the sphere of criminal law the earlier systems were discarded altogether,

[47] Interesting comparative figures are given in DUTT, *The Economic History of India under Early British Rule*, pp. IX-X.

[48] B. K. ACHARYYA, *Codification in British India*, pp. 336-337.

and the "Indian Penal Code" was the expression of the legislative authority of the State.

Another vital difference lay in the administration of justice. In Hindu India this was considered as one of the chief duties of the king who often heard cases in person. But the subordinate machinery for the administration of justice was not organized by the State for the most part. The system in Muslim India also was characterised by the absence of an elaborate and well-organized machinery for the administration of justice. "One of the most essential functions of a modern State is the administration of justice... Herein the Mughal Government was the weakest and least capable of improvement and expansion with time" [49]. There were courts of law at the Imperial and Provincial capitals and other big towns, but in the rural areas the administration of justice was left to the people themselves through their village *Panchayets* or other methods recognized by usage and tradition. Here, again, British rule with its elaborate network of courts of law, bringing State-administered justice to the reach of the common people, based on uniform and well-defined rules of procedure, introduced a fundamental change in the judicial system.

Evolution of the British Judicial Organization. The Charter of 1726 established at the three Presidency towns of Calcutta, Bombay and Madras a Mayor's Court with civil jurisdiction and a Court of Quarter-Sessions for criminal justice. These Courts were to follow English law and procedure, but the personal laws of Indians were not to be affected. The Charter of 1753 limited the jurisdiction of the Mayor's Courts over Indians only to those cases where they agreed to submit their disputes to these Courts [50]. At Madras and Calcutta, where the East India Company's authority was partially derived from grants by Indian rulers, it also maintained a different type of Court, based on the Indian system, the *Choultry* Court at Madras and the *Zemindari* Court at Calcutta, to decide civil and criminal suits involving Indians [51].

The grant of the *Diwani* in 1765 imposed on the Company a much larger administrative responsibility and particularly the need for setting up a more elaborate machinery for the administration of justice. The first step taken was in 1769 when British Supervisors were appointed to the various districts to supervise the work of the Indian agents employed in the collection of revenue and administration of justice. The letter of instructions to the Supervisors contained a scathing condemnation of the existing system of justice. "Certain it is that almost

[49] Jadunath SARKAR, *Mughal Administration*, p. 11.
[50] H. COWELL, *History and Constitution of the Courts and Legislative Authorities in India*, pp. 14-17.
[51] KEITH, *op. cit.*, pp. 47-50.

every decision of theirs is a corrupt bargain with the highest bidder" [52]. The attempt to reform the judicial system through English supervision did not result in any tangible benefit beyond bringing to light the deplorable state of affairs in the districts. In 1772, following the decision of the Company to undertake the collection of revenue and administration of justice through its own agency, a Committee of Circuit was appointed to draw up a detailed plan. The report of this Committee [53] led to the establishment of two chief courts of civil and criminal justice, the *Sadar Diwani Adalat* and the *Sadar Nizamat Adalat*, together with corresponding subordinate courts, *Mofussil Diwani* and *Faujdari Adalats*, in the districts. Supervisors were re-appointed in the districts as Collectors. They were not only in charge of the collection of revenue but also acted as judges of the civil courts, with powers of control over the criminal courts as well, consisting of Muslim law officers.

At the same time rules were promulgated, dealing with civil and criminal law, to guide the new courts. The most interesting point about these rules was the provision "that in all suits regarding inheritance, marriage, caste and other religious usages and institutions the laws of the Koran with respect to Muhomedans, and those of the Shaster with respect to Gentoos, shall be invariably adhered to ; on all such occasions the Maulavis or Brahmans shall respectively attend, to expound the law" [54]. In 1780 a further regulation was passed for the improvement of the administration of justice, revised in 1781, commonly known as Impey's Civil Procedure Code. In these early regulations we find a formulation of the two guiding principles of the British Indian system of justice : (a) to change the laws of the country as little as possible ; and (b) to apply the maxim of "justice, equity and good conscience" when it was necessary to change such laws [55].

The judicial machinery set up by the plan of 1772 was characterised by two chief features : the amalgamation of the functions of revenue collection and administration of civil justice in the hands of the Collector, and the retention of criminal jurisdiction in the hands of the old Muslim agency under the management of the deputy *Nazim*, Riza Khan, but subject to the supervision of the Collectors. For the next twenty years there were many changes in the judicial machinery leading to : (1) the separation, the amalgamation and again the separation of revenue collection and administration of civil justice ; and (2) the suppression of the office of deputy *Nazim* and direct management by the Company of criminal justice [56].

[52] H. T. Colebrooke, *Supplement to the Digest of Regulations and Laws*, p. 177.
[53] *Ibid.*, pp. 1-8.
[54] *Ibid.*, p. 5.
[55] *Ibid.*, p. 85.
[56] Cowell, *op. cit.*, pp. 167-172, 191-194.

In 1793 Cornwallis separated altogether revenue and judicial functions [57]. The Collectors were to be concerned with revenue collection only, while the administration of civil justice was entrusted to separate district judges. Minor civil suits could be decided by subordinate Indian judges like *Munsiffs* and *Sadar* Amins. The District judges also took over the magisterial powers of the Collectors. Another of Cornwallis' reforms was the abolition of the old agency for the administration of criminal justice. The office of the deputy *Nazim* was abolished and the *Sadar Nazamat Adalat* was re-established at Calcutta (transferred from Murshidabad) under the Governor-General and Council, aided by the Chief *Qazi* and two *Muftis*. The *Mofussil Faujdari Adalats* were replaced by four Circuit Courts with British judges, aided by *Qazis* and *Muftis*, since the criminal law was still supposed to be the old Muslim law, in spite of the changes made by the Company's regulations [58].

The system established by Cornwallis remained the principal basis of the structure of the judiciary and was gradually extended to other parts of India as British power expanded. There was one vital difference, however, since outside Bengal the strict separation between revenue and judicial functions was replaced at the district level by a concentration of authority in the hands of the District Collector and Magistrate. In this respect it was the Bengal system which was modified in 1859, to make it conform to the general pattern in the country [59].

Side by side with this chain of Courts established by the Company, there also functioned down to 1861 a different type of Court at the three Presidency towns, established by Parliamentary Acts and administering justice according to English laws and procedure, and not according to the regulations passed by the Company's authorities in India. The Regulating Act of 1773 led to the establishment of a Supreme Court at Calcutta, with ill-defined jurisdiction which promptly brought it into conflict with the Governor-General and Council over the rights of the Courts established by the Company [60]. Hastings sought to remove this conflict by effecting a union, although in an indirect way, between the Supreme Court and the *Sadar Diwani Adalat*, but it was disallowed by the Company. The Act of 1781 defined more precisely the jurisdiction of the Supreme Court which was given exclusive jurisdiction in Calcutta and over Europeans outside Calcutta. The Charter Act of 1813 placed Europeans outside Calcutta under the local Courts, subject to a right of appeal to the Supreme Court [61]. In 1797 similar courts, known as

[57] *Ibid.*, pp. 172-177.
[58] *Ibid.*, pp. 194-195.
[59] *Ibid.*, pp. 178-183.
[60] *Ibid.*, pp. 36-56.
[61] KEITH, *op. cit.*, p. 128.

Recorder's Courts, were established at Madras and Bombay, and later these were replaced by Supreme Courts (at Madras in 1799 and at Bombay in 1823). It is interesting to note that while the Supreme Courts were to follow English law and procedure, there was an express reservation respecting the personal laws of Hindus and Muslims [62].

The anomaly resulting from the division of jurisdiction between the King's and the Company's courts became increasingly glaring with the expansion and consolidation of British power. So the Charter Act of 1833 contained a declaration that it was " expedient that a general system of judicial establishments and police to which all persons whatsoever, as well Europeans as natives, might be subject, should be established in the territories subject to the Company at an early period" [63]. But the reform contemplated had to wait for another quarter of a century, till the transfer of Indian administration to the Crown.

Following the Indian High Courts Act, 1861, High Courts were established in Calcutta, Bombay and Madras in 1862, amalgamating the Supreme and *Sadar* Courts [64]. A trace of the earlier division of jurisdiction remained in the distinction between the original and appellate jurisdiction of the High Court, the former being derived from the Supreme Court and the latter from the *Sadar* Courts. The Charters of the High Courts reserved their personal laws to the Hindus and Muslims. Similar High Courts were later established in the other provinces also. The subordinate courts in each Province were brought under the administrative superintendence of the High Court, while a still higher centralizing factor was the Judicial Committee of the Privy Council, which heard appeals from the High Courts.

While requiring one-third of the Judges to be barristers (of the English, Irish or Scottish Bar) and one-third members of the Civil Service, an opening was made for the appointment of Indians to the High Courts, choosing the remainder from among the persons having held a judicial office for five years or having practised at a High Court for ten years. Indians were appointed to the High Court Bench long before they were appointed to corresponding ranks in the administration.

Effects of the British Judicial System. The greatest benefit rendered by the British judicial system was in helping the development of a modern secular state. This was done in two ways. The first was by basing law on the legislative authority of the State and not on religion. This conception of giving the law-making authority to the State is particularly necessary for a society sharply divided in religion, as in India, if it is to develop into a homogeneous unit for non-religious

[62] ACHARYYA, *op. cit.*, pp. 116-117.
[63] See Sec. 53 of Statute.
[64] COWELL, *op cit.*, pp. 225-232.

purposes. The second was by introducing uniformity in law and procedure, making all sections of the people subject to the same courts, the same law and the same procedure. To be sure, complete uniformity was not achieved, as the alien government in its anxiety to conciliate the subject peoples allowed them to retain their personal laws, which meant preserving diversity in some important aspects of civil law. But complete uniformity was introduced in criminal law and procedure and civil procedure. The British introduced the maximum uniformity possible in the circumstances, which went a long way towards fostering a spirit of national unity in India.

Another effect of the British judicial system was to make State-administered justice more readily available to the people by the establishment of an elaborate chain of courts throughout the country. It is sometimes argued that this elaboration of the judicial machinery made Indians more litigation-minded than before, but this hardly deserves serious consideration. There was less litigation in the past, not because there was less dispute, but because there were fewer means for obtaining justice.

The third effect of the British system was the increased esteem felt for the judiciary. The judiciary showed from the first an independence of spirit and an integrity which speedily earned the confidence of the people. The people looked upon it as their best protector, as the most impartial authority for redress of grievances, even against the illegal actions of the government and its agents. The historian of India must admit that the most significant achievement of the period was the establishment of the rule of law, an essential pre-requisite for the development of democracy.

Lastly we should note, as an effect of the British judicial system, the growth of a professional lawyer class, altogether new in India. In recent years there has been a tendency in some quarters to condemn this class as parasitical, but in reality it was the growth of the legal profession in the 19th century that was mainly responsible for the rise of an influential middle class. Law provided the first independent liberal profession for educated Indians and it is no wonder that the best talents were drawn to it in the early days. The lawyer class, with its western education and rationalistic outlook, was mainly responsible for the spread of liberal influences. It was from this class that political consciousness first arose and it was this class which furnished the early leaders of the nationalist movement.

IV. *CODIFICATION OF LAW*

Necessity for Codification. Codification of law was first mooted in the Charter Act of 1833, which led to the establishment of the first Law Commission for the purpose. Speaking in Parliament on that occasion Macaulay, who later became the first Law Member and President of the Law Commission, observed : "I believe that no country ever stood so much in need of a code of law as India, and I believe also that there never was a country in which the want might so easily be supplied..." [65]

Even allowing for some exaggeration on his part, it has to be admitted that conditions then were most confusing and needed immediate and wholesale reforms. In order to understand the state of affairs we have to trace the history of legislation and justice in British India to the time of Warren Hastings. The plan of 1772 has already been referred to but complete success could not be achieved since Hastings wanted to preserve the personal laws of the Hindus and Muslims. But even with respect to these laws Hastings sought to achieve clarity and definiteness and to enable the English judges to be familiar with indigenous laws through compiling them and translating them into English.

Since many aspects of law needed in a modern society were not covered by the indigenous systems, it was found increasingly necessary to fill the void in two ways: by Governmental regulations and by judicial decisions based on "equity, justice and good conscience" [66]. The instrument of regulations was used very extensively, particularly from the time of Cornwallis. The power of issuing regulations was separately exercised by the three Presidency governments of Calcutta, Madras and Bombay, and by 1833 the regulations had become not only too numerous and complicated but also contradictory because of the exercise of independent legislative authority by the three governments. Apart from regulations, there was a good deal of judge-made legislation also. The requirement to act according to "justice, equity and good conscience" was naturally interpreted by English judges as meaning English law adapted as far as possible to local conditions.

In criminal matters, Muhammedan law was maintained although largely modified by regulations from time to time as many of its provisions could not be enforced by a Western government. But haphazard legislation inevitably resulted in illogical classification of offences and conflicting provisions about penalties. The confusion was thus described by the Judges of the Supreme Court of Calcutta in 1829 : "No one could then pronounce an opinion or form a judgement, however

[65] ACHARYYA, *op. cit.*, pp. 90-92.
[66] *Ibid.*, pp. 94-97.

sound, upon any disputed right regarding which doubt and confusion might not be raised by those who might choose to call it in question" [67].

History of Codification. The Charter Act of 1833 sought to bring this confusion to an end by concentrating all legislative authority in the Governor-General and Council, appointing a Law Member to that Council, and setting up a Law Commission to enquire "into the jurisdiction, powers and rules of the existing courts of justice and police establishments in the said territories, and all existing forms of judicial procedures and into the nature and operation of all laws whether civil or criminal, written or customary, prevailing and in force in any part of the said territories" [68]. The first Indian Law Commission, appointed in 1834 under the presidentship of Macaulay, prepared a draft Penal Code in 1837. Later its labours resulted in drawing up a draft Civil Procedure Code and a draft Code of the Law of Limitation (1842) and also a scheme of pleading and procedure adapted to the provisions of the Penal Code (1848) [69].

For many years, however, no action was taken on these recommendations. Then a second Indian Law Commission was appointed whose duty was to examine the recommendations of the first and such matters relating to the reform of the judicial establishments, procedure and laws as might be referred to it. It presented four reports, containing a plan for the amalgamation of the Supreme and *Sadar* courts and a uniform code of civil and criminal procedure for all courts in British India. The recommendations of this Commission resulted in important legislation, and by 1861 much of the earlier legal confusion had been removed, and uniformity in the administration of justice was further secured by the Indian High Courts Act, 1861.

In 1861, a third Law Commission was appointed "to prepare for India a body of substantive law, in preparing which the law of England should be used as a basis." It submitted several reports, containing draft Codes relating to Succession and Inheritance, Contracts, Negotiable Instruments, Evidence, Transfer of Property and a revision of the Criminal Procedure Code [70]. Of these only the first was made law as the Indian Succession Act (1865), the others being shelved for the time being. Then the relations between the members of the Commission and the Government of India became strained, resulting in the resignation of the Commissioners in 1870. In the meanwhile the Government of India, under the guidance of Sir H. S. Maine and Sir James Stephen, was busy codifying other branches of law.

This feverish legislative activity created a reaction, and for sometime

[67] *Cambridge History of India*, Vol. VI, p. 382.
[68] Sec. 53 of the Statute.
[69] ACHARYYA, *op. cit.*, p. 63.
[70] *Ibid.*, pp. 66-67.

there was a considerable slackening of the pace. Then in 1879 a fourth Law Commission was appointed, whose labours resulted in the passing of Acts in 1881-1882, relating to Negotiable Instruments, Probate and Administration and revised Civil and Criminal Procedure Codes [71]. After these measures, until the close of the century, there was little fresh codification, and the Government of India busied itself with consolidating and amending the different branches of law.

Effect of Codification. How far has this process of codification affected Hindu and Muslim Law? Briefly, certain branches of Hindu and Muslim legal systems have been superseded altogether, while other parts have been modified by legislation, judicial interpretation and the silent working of the spirit of Western jurisprudence. Thus the Civil and Criminal Procedures are entirely new and so is the Penal Code, though the influence of the earlier Muslim system may be traced in the Penal Code, e.g. the provision about 7 and 14 years' imprisonment, which is a modern version of the provision in Muslim law inflicting the loss of one limb or two limbs as a form of punishment [72]. Muslim law was completely superseded by the Penal Code in 1860. The Indian Penal Code was strongly influenced by the French 'Code Pénal' and was in its turn copied in some of the other parts of the British Empire. The Civil and Criminal Procedure Codes mainly followed English procedure, in accordance with which trial by jury was introduced.

Comparatively little change was made in Civil Substantive Law, because, following the old policy of the Company's administration, the Charters of the High Courts and the Civil Courts Acts have reserved their own Laws to the Hindus, Muslims and other communities in India, so far as they relate to succession, inheritance, marriage, caste or any religious usage and institution, but even in this sphere important modifications have been made by legislation [73].

So far as Hindu and Muslim laws are concerned, there is another instrument of change, operating silently but quite as effectively. "In such parts of the law as are not covered by the Acts of the Indian Legislature the Hindus and Mahomedans continue to live under their respective laws. But the Hindu and Mahomedan laws have not stood unchanged, for the effect of the more careful and thorough examination, which the contents of these two systems have received from advocates, judges and text-writers, both Indian and English, imbued with the scientific spirit of Europe, has been to clarify and define them, and to develop out of the half-fluid material more positive and rigid doctrines than had been known before." [74]

[71] *Ibid.*, pp. 71-72.
[72] *Ibid.*, pp. 281.
[73] *Ibid.*, pp. 286-290.
[74] *Ibid.*, p. 38.

V. *EDUCATION*

Evolution of the Educational System. British rule deserves credit for the introduction of western education more than for the numerous material benefits commonly listed as Britain's gifts to India. Even the narrowness and bigotry of men like Macaulay and the Christian missionaries really turned out to India's advantage in a way which they could not have foreseen.

India in ancient and medieval times had a long and brilliant tradition of education, but in the 18th century for various reasons there was a marked decline in education—political confusion, economic dislocation, shrinkage of avenues of employment as a consequence of the administrative changes with the expansion of British power, etc. The most important factor, however, was the lack of creative intellect which caused Indian education to degenerate into that idle argumentativeness which characterised the schoolmen of medieval Europe.

The British government in India did not start with any definite policy regarding education, and did not for long admit any responsibility on its part to provide educational facilities for the people. Thus in the early period the measures adopted for the promotion of education were due only to the initiative of a few individuals, who either felt a deep personal admiration for Indian classical studies, like Warren Hastings, Sir William Jones and others, or who realised the necessity for training men in Hindu and Muslim laws to assist the European judges in the administration of justice.

The Government itself would not have gone further but for the pressure of public opinion in Britain, especially that of the Evangelical party which evinced a keen interest in bringing about a moral uplift of Indians through the spread of Christianity and English education. When the Charter of the Company came up for renewal in Parliament in 1793, Wilberforce made a proposal for sending school masters and missionaries to India "for the religious and moral improvement of the native inhabitants". The Directors, however, opposed it and urged that "the Hindus had as good a system of faith and morals as most people and that it would be madness to attempt their conversion or give them any more learning or any other description of learning than what they already possessed" [75].

But although as yet the Company was strongly opposed to any idea of encouraging missionary activity in India and introducing English education, things were quickly passing out of its hands through the activities of missionaries like Carey, Marshman and Ward, and free thinkers like

[75] H. SHARP and J. A. RICHEY, *Selections from the Educational Records of the Government of India*, Vol. I, p. 17.

David Hare who conceived the idea of starting a school in Calcutta for educating young Indians in Western literature and science. Before this Christian missionaries, with Tranquebar and Madras as centres, had been long active in south India [76]. Opinion in Britain also was gradually changing about the need for active measures for the promotion of learning in India. In these circumstances when the Charter of the Company came up for renewal in 1813, a clause was inserted in the Act to set apart a *lakh* of rupees annually for "the revival and improvement of literature and the encouragement of the learned natives of India and for the introduction or promotion of a knowledge of the sciences among the inhabitants of the British territories in India" [77].

The clause was rather vaguely worded and did not indicate clearly the type of education on which government money was to be spent. The result was that down to 1823 nothing was done to implement it, except giving indiscriminate grants to a few existing institutions. In 1823 a General Committee of Public Instruction was set up, which, under the inspiration of two leading Orientalists, H.T. Prinsep and H.H. Wilson, decided to interpret the clause in the Act of 1813 in favour of founding Oriental Colleges (a Sanskrit College was started in Calcutta) and translating and publishing works in Oriental classical languages [78]. In the meantime several institutions for English education had been started through the efforts of missionaries and individuals like David Hare and Ram Mohan Ray—the Hindu College (1817) and the Bishops College (1818) in Calcutta, the Serampore College (1818), and the Agra College (1823), besides a large number of schools. Among Indians the desire for English education was rapidly growing, no doubt largely because it offered a lucrative avenue of employment but also because it opened a world of new ideas.

This development led in the thirties to a bitter controversy among the members of the Committee of Public Instruction, one group advocating the continuance of the old policy of encouraging Indian classical studies, "engrafting European science thereon", and the other bent on spending all available funds on the spread of English education. The conflict came to a head with the appointment of Macaulay as President of the Committee in 1834. Macaulay came to India with a strong prejudice against the Indian classics and cultural heritage. In his celebrated Minute, dated 2nd February 1835, he violently attacked Oriental studies in words which will evoke a contemptuous smile in a modern historian—"Who could deny that a single shelf of a good European Library was worth the whole native literature of India and Arabia?". He strongly urged that all available State funds should be

[76] *Report of the University Education Commission (1948-49)*, Vol. I, p. 13.
[77] Sharp and Richey, *op. cit.*, Vol. I, p. 22.
[78] A. N. Basu (Ed.), *Adam's Reports on Education*, p. XV.

devoted to the promotion of English education and expressed a hope that this would produce a class of persons "Indian in blood and colour, but English in tastes, in opinions, in morals, in intellect". The Governor-General agreed with the views of Macaulay, and on the 7th March 1835 a Resolution was passed in favour of "promotion of European literature and science among the natives of India" and laying down that "all the funds appropriated for the purpose of education would be best employed on English education alone".

Thus was effected a complete revolution in Indian education, leading to far-reaching results. It is easy to sentimentalise over the neglect of Indian classical studies, but looked at from the proper historical perspective it would appear to have been a shock-treatment which India needed at the time. India had long fallen into a state of intellectual torpor and some shock from outside was necessary to rouse it to activity. That shock came from the impact of Western thought, through English education, and the result was that in due course Indian thought once more became creative. Not only did it lead to the introduction of new ideas but it also gave a new impetus to the study of Indian classics and the development of modern Indian languages.

Before the next important landmark in the history of Indian education, Wood's Despatch of 1854, a large number of secondary schools and colleges had been started, mostly in Bengal, to impart education through the medium of English. The education imparted was more literary than scientific, because it was less expensive and also because it conformed more to the tastes and inclinations of the people to receive it. Moreover, literary education through the medium of English received a strong impetus from the decision of the Government in 1844 that candidates qualified by a knowledge of English would be preferred for the public service. However, scientific and professional education was not altogether ignored [79]. A Medical College to impart training on Western lines was first established in Calcutta by Bentinck and within a few years two more Colleges were established in Bombay and Madras. Attempts were also made to start Engineering Colleges, but they were not very successful, with the exception of the institution at Roorkee, established in 1847. Provision was also made for the teaching of law and it soon became a very popular course of study, since law offered the most lucrative independent career to the English-educated middle class.

In 1854 Sir Charles Wood, President of the Board of Control, in his celebrated Despatch, outlined an integrated and comprehensive scheme of education from the primary to the university stage. The old narrowness of the Resolution of 1835 was to be replaced by a broader vision.

[79] *Report of the University Education Commission (1948-49)*, Vol. I, pp. 15-17.

The indigenous village schools were not to be neglected but to be incorporated in one integrated system of primary, secondary and higher education. Voluntary efforts were to be supported by grants-in-aid from the State. Moreover, while the emphasis on English as the principal medium for the diffusion of Western knowledge was to be retained, careful attention was also to be paid to the Indian languages. Another important suggestion was to establish universities. No time was lost in implementing this scheme thus outlined. Departments of Public Instruction were created in each province and three Universities were established in Calcutta, Bombay and Madras in 1857. Secondary schools and colleges multiplied rapidly in the next fifty years, but primary education did not show a corresponding expansion, nor did scientific and professional studies show much development till the second decade of the 20th century.

Effects of the new System of Education. The educational structure thus built up was characterised by certain features which deserve attention. First, there was a disproportionate emphasis on literary education. This was partly due to the government's view that the objective of education was primarily to make available a suitable number of Indians for the lower and middle cadres of government service. Secondly, since there was no plan of industrialisation in India, there was practically no avenue of employment in the 19th century for men trained in science and technology. With the growth of industries in the 20th century the Indian educational pattern has been largely altered. Thirdly, the emphasis on literary studies perfectly conformed to the tastes of the people, since for centuries education in India, as in China, was confined to literary studies. But, it must be noted, the emphasis on literary studies produced one remarkable effect. The English-educated Indians readily assimilated the social and political outlook of the West, particularly the ideas of democracy and freedom, which they considered nobler achievements of European civilization than material progress.

The second characteristic of the educational pattern was the greater emphasis on higher education with a consequent neglect of mass education. The result was the creation of a wide gulf between the educated class and the mass of the people involving an adverse effect on national solidarity and progress. At the same time one thing may be said in favour of the "infiltration theory". If, instead of educating a small class well and providing thereby the proper leadership in a national movement, the educational system had been more broad-based from the start, it is doubtful whether Western ideas could have permeated Indian thought so successfully and political consciousness been roused so quickly.

The third striking feature was the rather haphazard and unplanned growth of the educational structure, guided more by considerations of

cost than of quality. This was due to the hesitant policy of the Government and its unwillingness to bear more than the minimum burden of responsibility for education. Expansion of educational facilities fell into private hands, institutions sprang up without any overall planning, there were wide divergencies in aims and objectives but there was unity on one point, namely to get higher education on the cheap. This naturally led to an increasing deterioration of quality and standard, which persists even today as the principal drawback of the Indian educational system.

Another feature of the educational system was the use of a foreign language, English, as the medium of instruction in all subjects in the secondary schools and colleges. This had the effect of putting an undue strain on the students and made the study of English more important than the acquisition of knowledge in different branches of Arts and Sciences. But this much must be admitted that the intensive study of English and the assimilation of Western ideas through first-hand in place of second-hand sources made the ground work more solid and gave a stronger impetus to the creative genius of the people, as the history of the Indian re-awakening in the 19th century amply testifies. There was once more a strong creative impulse in every sphere, a new urge to move on, which in the long run helped the development of modern Indian languages, making them fit vehicles for the transmission of the subtlest ideas and knowledge of the newest developments in science and technology.

The most important and far-reaching result of the new educational system, however, was the growth of a professional middle class. The emergence of this class, having the same type of education, possessing a common vehicle of expression, acquiring the same social and political outlook and conscious of the unity of economic interests linked with a few liberal professions, forged a new link of unity in the Indian social structure which cut across the earlier divisions—racial, linguistic, geographical and religious. In the 19th century a Maratha teacher could feel perfectly at home in the company of a Bengali lawyer, and a Muslim *Talukdar* of north India could fraternise with a Hindu journalist of south India in a manner that would have been unthinkable in an earlier age. It was the unity of the middle class, vocal and assertive, able to communicate with the foreign rulers in their own language and with the masses in theirs, that was mainly responsible for the growth of political consciousness among the people and a sense of Indian nationhood. In spite of the attempts of conservative British administrators and Indian extremists to belittle the importance of the middle class, it must be admitted by any impartial historian that the main credit for the regeneration of India belongs to this class, primarily a product of the system of education introduced in the 19th century.

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JEWRY AND JUDAISM IN THE NINETEENTH CENTURY *

I. *SOCIO-HISTORICAL SURVEY*

THE beginning of the nineteenth century ushered in a new epoch in Jewish history. This change affected the social, political, religious and cultural aspects of the traditional pattern of life. The history of the era in point may find its analogies in the course of the three millenia of Jewry's past, but actually it stands without exact parallel. Up to the last third of the eighteenth century, Jewry was always recognizable as a clearly defined social unit, distinctly set apart from the community at large in whose midst they had settled. Their religious traditions with the attending institutions, rites and symbolic expressions created for the adherent an exclusive sphere. The social segregation which resulted from the adherence to their own religion was brought into even sharper relief by the fact that this religious tradition bore elements as well as forms of expression of a national culture. Some holidays and religious symbols were not only designed to manifest transcendental concepts of the creed ; they also served to observant Jews as reminders of their national past and of the messianic future which would bring redemption to the world and a reunion of Israel in the land of the ancestors. The records of tradition, viz. Bible and Talmud, were always taught in the national tongue of yore, i.e. Hebrew, or the cognate Aramaic, which had been adopted early in ancient times. Elements of this language including the concepts, mental pictures, and mode of thinking induced by it, penetrated, particularly through the medium of study at all ages, into the respective vernacular of the Jews, in consequence of which the Jewish community developed a particular brand of dialect which was apt to accentuate their segregation linguistically ; in some cases this deviation from the locally customary mode of speech created a jargon.

* Recommended by Professor MORAZÉ, Author-Editor of Volume V.

The preservation of this religio-cultural singularity was, of course, dependent on the political restriction of the Jews, which for centuries had been in force as the accepted policy in all Christian and Mohammedan countries. This attitude towards the Jews, which had become an unchallenged tradition, rendered them direct subjects to the respective political power. The discrimination, from which Jewry during all these centuries suffered more than other unprivileged groups of the community, consisted of their being deprived of any claim or right to stay at their place of birth or residence. Residential and commercial permits had to be petitioned from and paid for to the potentates. These circumstances make it clear why also from the economic aspect the Jews occupied a peculiarly restricted position. Nowhere did they participate in all branches of local economic life. Only commerce and finance, sometimes a few of the trades, and of the professions only medicine at the best, were accessible to them. The configuration of all these elements and traits results in the portrayal of a distinct social unit which is at variance with its environment in all essential features.

The description sketched above of the tradition-bound Jewish community and its adjustment to the life of the respective national hosts has to be borne in mind primarily as historical background upon which the development of Jewry took place in the course of the nineteenth century. Yet actually this description holds true for a large part of this minority even throughout the century. According to the accepted demographic estimate, there were about two and a half million Jews at the end of the eighteenth century. At the end of the nineteenth century there were about ten and a half million—a rate of increase which in percentage exceeds for this period all other European peoples. This rapid multiplication of Jewry was not equally distributed among all its parts. Of the two and a half million at the end of the eighteenth century, one million, or 40 %, were made up of Jews in the Orient (in the large Turkish Empire and North Africa). Of the remainder, a million and a half lived in East and Central Europe. The number of Jews in overseas countries was insignificant. This picture, however, is entirely changed by the end of the century. Whereas the number of Oriental Jews remained about the same, European Jewry constituted about 80 % as the result of their rapid natural increase. The remaining million, or 10 %, lived in America, to which country during the second half of the century, particularly since 1880, the first wawes of Jewish mass immigration were directed [1].

The distribution of the Jewish population in the various European countries has to be taken into consideration for a true appreciation of these demographic facts from the socio-historical aspect. Special attention

[1] RUPIN, Arthur, *Soziologie der Juden* (Berlin, 1930), Vol. I, pp. 67-100, and *The Jews in the Modern World* (1934), pp. 21-30.

is to be paid to the fact that out of eight million Jews in Europe, five million lived in Russia. In this empire the great events of the century caused some political and social repercussions, but no new social order emerged from them. The major part of European Jewry remained in the religio-cultural and socio-political segregation described above. The change at the beginning of the century affected only the position of the Jews in Western Europe and in the United States of America. Of course, the revolution that took place with regard to the position of Jews living in the leading countries of civilization had its bearing, if not immediately, upon the fate of Jewry all over the world. This justifies also the tendency of historians to pay particular attention to events occurring in Western countries.

The change that occurred with the position of the Jews in Western countries may be briefly summed up: the heretofore conditionally admitted residents, in most cases also locally restricted to Jewish quarters, became full-fledged citizens of the respective states. At the latest in the second or third generation, these new citizens became extensively adjusted to the customs of the respective bourgeois society, thus creating a new type of the German, French, or English Jew. This metamorphosis is in no way the result of an inner Jewish development, but rather the effect of political and social changes which took place in these countries. The first signs of relaxation in the relationship of the Jews towards their surroundings appeared at the latest in the last third of the eighteenth century, as a result of the acutely growing criticism levelled against the prevailing rigid class structure of the state and the class stratification of society, in which the segregation of the Jews was pointed out as an anomaly and therefore condemned. The proponents of this criticism were the bourgeois intellectuals in France and Germany. These circles also witnessed the first acquaintance of Jew and non-Jew, at which direct personal contact in form of unreserved fraternization and fellow-feeling for common interest in the promotion of cultural values prevailed. The meeting and resultant life-long friendship between Moses Mendelssohn (1729-1786) and G.E. Lessing (1729-1781), which produced so much mutual inspiration, may serve as its best example. In these critical minded circles of intellectuals the concepts of integrating the Jews into the community at large were moulded. These concepts were then associated with the claim for Jewish equality within the framework of the prospective federal union of states. Here finally the wish for Jewish assimilation in culture and customs found its expression. Just as in other areas of social transformation, also here the anticipating ideology proved as a driving force, although it could not serve as a guide for developments to follow; for the actual change did not, as in the concept of the intellectuals, take place as a victory of rationality over traditional prejudice. The absorption of the Jews rather came in the

wake of the general political and social changes which resulted from the French Revolution, the aftermath of which lasted until the middle of the nineteenth century. The new order, based on the direct relationship of the citizen to the state, could not possibly suffer in its midst autonomous Jewish communities with their singular rights and restrictions. Thus the delegates to the French National Assembly were entirely consistent when pointing out that the state faced the dilemma either to recognize the Jews as equal citizens, or to expel them from French territory. Since for humanitarian reasons the expulsion of the Jews had been hardly acceptable, the only alternative that remained was to confer equality upon the Jews as citizens. The logical consistency of the argument had to combat bias and prejudice which had been cherished and nurtured for centuries. Hence the National Assembly, which had proved so change-happy throughout, had to postpone until shortly before its dissolution the official announcement of granting equal citizenship to the Jewish subjects of France (September 27, 1791) [2].

The same spectacle was repeated in the course of the century by the various legislatures of the European states. The advocates of a consistent interpretation with regard to the modern idea of state claimed equal citizenship rights for the Jews. Reactionary elements, prompted by prejudice and heretofore accustomed notions, tried to impede this course of development. After many a fight, advances and reverses, the principle of granting universal right of citizenship independent of religious persuasion prevailed. The most important date pegs in the ups and downs of this development are: the Prussian Edict of Emancipation (1812); the revocation of rights obtained in German lands in the wake of the Vienna Congress (1815); and the removal of the Christian faith clause from the oath for public officials in England by an act of Parliament (1858). With the achievement of citizenship rights in the Austro-Hungarian Empire (1867), in the newly founded German Empire (1870), and in Switzerland (1877), the historical process of Jewish emancipation came to a successful conclusion in Western Europe. Citizenship rights had implicitly been guaranteed to Jews in the United States of America by the American Constitution (1790) [3].

The new historical situation, which, in spite of the intellectuals' ideological anticipation, took the majority of Jews by surprise, confronted the Jewish community with unprecedented tasks. The practice of the newly attained political rights required of them cultural and social adjustment. This situation made it incumbent upon them to completely master the language of the community at large and to modify

[2] DUBNOW, S., *Weltgeschichte des jüdischen Volkes* (Berlin, 1925-29), Vol. VIII, pp. 83-121.
[3] *Ibidem*, Vol. IX.

their traditional mode of living. The ancient tradition-bound institutions had to be changed, tempered, or foregone entirely. The history of Jewish education and its institutions may well serve here as a characteristic example. The Talmudical schools and academies (Yeshivoth) which up to now fulfilled the educational functions, disappeared within two generations. In their stead emerged either Jewish schools which emulated in almost every respect the schools of their surroundings, or the idea of a separate Jewish school was dismissed in favour of entrusting the education of Jewish youth to the public schools. This step led to the exclusion of the specifically Jewish elements of tradition which for many centuries had moulded the spirit and character of the people. We shall see in the second part of our survey what attempts were made to ensure for the Jewish community a kind of conscious self-identification and to uphold their historical moorings without impeding their blending with the present non-Jewish environment. In any case, one may speak of a process of disintegration at the beginning of the nineteenth century, as far as the Jewish community is concerned. Many contemporaries welcomed this process and gladly promoted it. For the sake of historical justice we are bound to say that this affirmation was not merely motivated by utilitarian reasons.

The assimilation-happy Jews, as one might call them, always found an idealistic rationalization for the amalgamation with their environment. Mendelssohn already felt that his friendship with non-Jews constituted a triumph of pure humaneness [4]. The admission of many other Jews to the circle of men of letters was hailed by enlightened Europeans as a humanistic accomplishment. Later on, particularly under the influence of prevailing ideas to which the average citizen was prone, nationalism in the respective country became an assimilatory element. The simultaneous appearance of modern nationalism with the emancipation of the Jews is no historical coincidence. The precipitation of the modern state and modern society gave rise to both trends in Jewry at about the same time. The newly emancipated Jews joined these nationalistic movements enthusiastically. Joyously they rallied to the banner of fighting for national liberation and nationalist revolutions in France, Germany, Poland and Hungary. In retrospect we may see it to-day that their ready and easy joining of the nationalist ranks was meant as means to legitimate their newly granted political rights. However, subjectively the nationalistic idea of their respective country of adoption was genuinely cherished, and their sacrifices for it were joyously offered [5].

[4] KATZ, Jacob, *Die Entstehung der Judenassimilation und deren Ideologie*, Diss. Frankfurt a/M., 1934.

[5] OFFENBURG, B., *Das Erwachen des Deutschen Nationalbewusstseins in der preussischen Judenheit*, Diss. Hamburg, 1933.

Similarly fared the third element, which served for many as ideological and social medium for assimilation: socialism. The Socialist movements of the nineteenth century attracted many Jews and imbued them with sympathy and readiness to struggle alongside the socially disabled. In this case too we have to distinguish between the objective historical forces at play and the subjectively expressed rationalizations. The Jewish socialists shared the faith of their non-Jewish comrades to serve in the cause of bringing social salvation to the world. The fact that they found at the same time a solution for the problem of their own social adjustment remains incidental and a posterior sociological observation.

The necessity of an assimilatory element, which would safeguard the legitimacy of the Jew's fusion with his environment as called for the new situation, makes it clear that his problem of adjustment was of a social nature. Indeed it was rather a complex problem. The social disabilities under which he had suffered for generations, and from which he had just been unexpectedly rehabilitated, did not put the Jew at ease to naively enjoy the newly granted rights. Complete inner and outer adjustment could hardly be achieved within a short span. Even Jewish freethinkers preserved certain typical traits in their thinking and bearing, often even in their appearance. He who did not entirely sever his relations with the religious congregation remained in his Jewish consciousness moored to certain sentiment-charged symbols. The self-consciousness of a minority facing a majority which urges constant self-justification never did disappear entirely. The majority could only be expected to demonstrate its good will in showing consideration for the existing differences, without overlooking them. The concept of typically Jewish traits was never ignored even in circles which showed a most sympathetic and favourably inclined attitude. Radical assimilation, a utopian dream which envisioned Jewry's complete absorption by their environment, thus solving the "Jewish Problem" for all times, never stood a real historical chance. In reality, the nineteenth century solved the political aspect of the problem by granting emancipation to the Jews, thus substituting the social aspect of the problem for the political one.

The inefficacy of complete assimilation became even more disillusioning by the historical data. On the basis of the new political situation, Jewish and non-Jewish advocates of the emancipation came to expect and even prophesy a vocational reconstellation of the Jews. They believed in particular that the newly granted right to acquire and hold real estate would induce a part of the Jews to engage in agriculture, to become peasants and farmers. Such plans, however, lacked the sociological prerequisites. The general urbanization, characteristic of the nineteenth century in general, made no exception of the Jews. As a matter of fact,

more than in any previous times did the Jews become now metropolitans and megapolitans, a signal feature of demographic changes during this era. Nor did the concentration of Jews upon certain vocations, trades and professions disappear. The economic freedom of choice which as a matter of principle took effect in the countries of emancipation, broadened the vocational distribution of the Jews in so far as it afforded them a wider choice in the various branches of industry and commerce, particularly however in the professions. It has to be borne in mind that many such new opportunities only developed in the course of the emancipation period as a result of the general social and economic evolution. However, agriculture, mining, or soldiering represent occupations which were held traditionally by certain social strata, and therefore, barring rare exceptions, offered little attraction to the Jews. Factually, these occupations were not even made available to them. Hence the vocational redistribution of Jews in all the respective countries shows little change during the age of their emancipation. This stability, in turn, facilitated their identification and promoted their cohesion to a large extent [6].

Perhaps an even weightier obstacle in the way of complete assimilation was the fact that the emancipation affected Jewry only in some of their respective countries of settlement. Russia's five million Jews, a quarter of a million Jews in Rumania, and a million Jews in oriental countries of the nineteenth century, were not engaged in a struggle for their political rights, but in defence of their personal security and economic existence. According to the theories of their radical assimilation, the cohesive bonds with Jews in other countries should have become severed as soon as the Jews of certain countries enjoyed political equality. In fact, however, Jewish solidarity proved itself also during the nineteenth century beyond all national and territorial boundaries as a real social force. On the occasion of the Damascus Blood Libel (1840), when confessions were extorted from Jews by means of torture, the notables of French and English Jewry, A. Crémieux and M. Montefiore, personally intervened, and were acclaimed by Jewry all over the world and highly commended by liberal public opinion throughout the civilized countries; they were received in audience by the Sultan and gained acquittal and rehabilitation of the innocently accused. Since then, the mutual interest of Jewry in the several countries for the fate of their brethren anywhere in the world has become an accepted responsibility. This feeling of solidarity found its organizational expression in the founding of the Alliance Israélite Universelle (Paris 1860) [7]. This and

[6] RUPIN, Arthur, *Die Soziologie der Juden*, Vol. I, pp. 101-127, 315-499, and *The Jews in the Modern World*, pp. 130-226.

[7] LEVEN, N., *Cinquante ans d'histoire : l'Alliance Israélite Universelle, 1860-1910* (Paris, 1911).

many similar organizations had been active throughout the century to obtain political rights for the Jews in countries which had not yet granted them full citizenship (e.g. at the Berlin Congress, 1878), and also to raise the social and cultural level of retarded communities in Eastern Europe and oriental areas.

From the ideological aspect, the sentiment of Jewish cohesion transcending boundaries of state and territory did not imply any Jewish national basis or aspiration. Actually, their readiness to come to the assistance of any Jewish community in another country which was in need or suffering, went hand in hand with their readiness to adjust themselves to their respective environment, with their devotion to the duties of their state, and their passionate participation in the political and cultural life of their adopted country. The problem which presented itself in this attitude of dual loyalty was vaguely felt, yet rarely subject to conceptual analysis. Only here and there voices were heard which demanded for the solidarity of world Jewry a firmer basis in the form of a nationalistically tinted ideology with politically oriented objectives. Up to the eighth decade of the century, such ideas were sounded mainly by traditionalist thinkers, who regretted the disintegration of the time-honoured pattern of life and, with reference to their messianic faith, championed the cause of a Jewish national revival on the historic soil of the ancestral homeland. The possibility of the dialectical development which leads from large-scale assimilation to Jewish nationalism has been demonstrated by the leading socialist Moses Hess. In his *Rome and Jerusalem* (1862), he expressed his surprising endorsement of Jewish nationalism, advocating the resettlement in Palestine like one of the traditionalists. Such opinions, however, were hardly favoured with any attention up to the sixties, and if at all considered—ridiculed, and if taken seriously—bitterly combatted. These nationalistic aspirations were denounced as jeopardizing the prospects for emancipation during the entire period of struggling for it. When the struggle reached its successful conclusion in the West, the time for a synthesis seemed to have arrived. After 1860 organizations were already actively engaged in colonizing Palestine. In 1870, the executive of the Alliance Israélite Universelle in Paris blessed a resolution to establish an agricultural school in Palestine. These precursors of the nationalist movement could hardly have accomplished anything significant, had it not been for the onset of anti-Semitism as a social reaction in the eighties. The anti-Semitic wave of 1880 in Germany, the Dreyfus Affair of 1894-99 in France, and similar phenomena in Austria and Hungary, are largely to be explained as a result of domestic developments in the respective countries, resulting from political differences and social tension. However, all these anti-Semitic movements took their point of departure from the fact of the Jew's incomplete assimilatory process. The existence of singular Jewish

traits, the narrow vocational distribution of the Jews, and their feeling for solidarity, provided material for the demagogue to justify Jew-baiting and hate-mongering, and to prove that Jewry constituted an ever-alien and insoluble element within the respective national body. The radical anti-Semites were not merely satisfied to present these theses as a moral defamation, but drove the matter to a programatic conclusion: the emancipation of the Jews had been a historical mistake and must be rectified by revocation. Anti-Semitism manifested itself in social tensions in the West, whereas in the East, for example Russia and Rumania, where emancipation had at best merely reached the paper stage, the anti-Semitic wave brought on economic restrictions, expulsions, and pogroms [8].

The anti-Semitism of the eighties took the Jews in the West by surprise. Signs of social exclusiveness towards the Jews, which had not been wanting in former days, were now relegated as passing relics of outmoded prejudice. However, the expressions of brutal hate and vile defamation called for a profounder interpretation of the phenomenon. The Jewish public opinion in the West found by and large its comfort in the illusion of progress, which anyhow had been an integral part of the liberal-bourgeois ideology. These circles attempted now to combat anti-Semitism by means of rational enlightenment of the opponents. Not so in Russia and Rumania, where the very existence of the Jewish masses was endangered by the anti-Semitic threats: the Jews of the East resorted to emigration. Since this part of Europe contained large Jewish masses, the consciousness of national cohesion was felt here much more acutely than in the West, which provided for their disposition for interpreting the events from a nationalist aspect. As a matter of fact, since the eighteen-eighties an outspoken nationalist movement took shape, which set as its objective the reintegration and regeneration of national Jewish life upon the historical soil of its homeland, Palestine. With this era coincided the first wave of emigration to Palestine. It was characteristic of Western Jewry that although it did not emulate this act, it lent its moral and financial support to it. In any case, the Jews of Western Europe had, after all, also gained some historical experience during the last phase of their metamorphosis, which called their attention to grave problems of Jewish existence in the immediate environment. Nationalist tendencies also revealed themselves here and there in the founding of several organizations and associations. When Theodore Herzl, on the occasion of the Dreyfus affair, arrived at the conclusion—which even to his own consciousness came as a surprise—that the Jewish problem could only find its solution in the establishment of a Jewish State, he found a

[8] ELLSOGEN, I., *A Century of Jewish Life* (Philadelphia, 1944), pp. 141-223.

responsive, if not as radically consistent and aggressive, following in every country where Jews were settled. The function of convoking the first Zionist Congress at Basle in 1897 was to consolidate the already active national forces. Just as the convocation, at Napoleon's behest, of the Sanhedrin at Paris in 1808, which felt as its task to bestow its official blessing and religious sanction on the assimilationists, may be seen as the opening event of this epoch, so the Zionist Congress of 1897 may be considered and evaluated as its conclusion. The historian who chooses as his perspective the actual restoration of the Jewish State fifty years later, will primarily see the Zionist Congress of 1897 as a point of departure for the subsequent materialization of the idea which emerged as a resolution and political program from these deliberations. Yet from the aspect of direct and organic historical concatenation, its significance lies rather in the solemn declaration manifesting the vital urgency of national self-affirmation in the face of a century which had witnessed Jewish degeneration and disintegration. This declaration was made by the consolidation of their nation-conscious forces, appearing publicly before the world, arousing and challenging the Jewish people wherever they were scattered.

II. *RELIGION AND PHILOSOPHY*

The historical events, described in the first part of this survey, which brought about such a radical change in the position of Jewry at the turn of the eighteenth century, found their precipitation also in the realm of the spirit, as in the field of religious philosophy and theology, in the results of historical research, and in the social and national ideologies. Heretofore, as long as the Jew was segregated from the surrounding world, being Jewish posed no problem to him. Hence all religious traditions were accepted naively and unchallenged. Aside from a few rare exceptions like Spinoza (1632-1677), even the most distinguished minds found in the study and observance of this tradition their intellectual satisfaction, presenting as it did a world of faith and thought which corresponded to their own perception of reality.

When, however, the contact with the larger environment, particularly in the intellectual circles, became the rule of the day, the horizon broadened, and spiritual orientation was sought with the help of philosophy and scientific methods. The Jewish identity grew into a problem. The former naive acceptance was now replaced by self-conscious reflection about the religious tradition, its historical truth, its intrinsic value, and its meaning for the present and the future. In this process of intellectual reorientation it was also Moses Mendelssohn (1729-1786) who

loomed as the leading figure. The historical situation challenged him with its problem and forced him to take his stand however reluctantly. In the beginning Mendelssohn thought it possible to evade the issue. However, when he was asked again and again to state and show cause for his identification with traditional Judaism, he finally felt compelled to present and demonstrate publicly his concept of Judaism and its relationship to other systems of faith and thought. This he did in his book *Jerusalem*, published in 1783, in which he upheld the Divine revelation on Mount Sinai as the source of the Jewish religion. The novel and surprising feature of his concept of Judaism lay in the fact that he limited the content of Sinaitic revelation to a definite part of the religious tradition, viz. the ceremonial laws. The purpose of the Sinaitic revelation was the enactment of the ceremonial laws. This enactment remained in force for the Jewish people for all times to come. The doctrinal part of the tradition, however, the system of ethics and the tenets of faith, was rationally accessible to all mankind. This dichotomy corresponded to the prevailing philosophy of *Auflärung*, according to which man could rely on Reason as a guide to arrive at a true creed and valid ethical norms. This doctrine, which became associated in the course of the eighteenth century with the concept of "natural religion", constituted also for Mendelssohn a self-evident truth. Therefore he could not credit the Jewish religion with the revelation of metaphysical doctrines, and only the ceremonial laws were left as the characteristic feature of Judaism. Mendelssohn created with this system a religious platform well suited for his personal position. His loyalty to the traditional way of Jewish life safeguarded his Jewishness. At the same time, however, he had justified his spiritual kinship with the non-Jewish intellectuals of his day. Was it not in the spiritual, non-ceremonial realm that all rational religions met on common ground, admitting no differences and granting no priority to the adherents to the Jewish religion? The particular feature of Judaism, the law and the commandments, was destined only for the Jewish race. Although historically unjustifiable, Mendelssohn identified Judaism with the idea of religious non-missionary tolerance. He contended that Judaism had never tried to win any converts to Judaism, nor had it disclaimed salvation for those adhering to other religions. Judaism merely enjoined the Jews to keep the ceremonial laws, which, in turn, would lead to the pure preservation of the creed rationally accessible to all mankind [9].

Mendelssohn's concept of Judaism could hardly satisfy the next generation. His theory had equal effect upon Jew and non-Jew by identifying Judaism as a rationally demonstrable faith. Following in

[9] GUTTMANN, Julius. *Die Philosophie des Judentums* (München, 1933), pp. 303-317.

his footsteps, the theorists of Judaism in the nineteenth century took their guidance from the rationalist philosophers of the Middle Ages. The mystical trends of the past and present, Cabbalism and Hassidism — the latter flourished in Eastern Europe from the middle of the eighteenth century as a great religious movement—were either disregarded or declared as aberrations which may be retraced to alien influences. However, in contrast to Mendelssohn's denial of any revealed doctrines in Judaism, these theorists pressed for the creation of a Jewish system of theology and ethics. The necessity for such a doctrinal system was made stringent by a significant change in the position of the generation succeeding Mendelssohn. To Mendelssohn the unifying bond of the Jewish people was guaranteed by their observance of the ceremonial law, and he could therefore dispense with a doctrinal system. The next generation found itself in a situation in which the observance of the ceremonial tradition could no longer play this function. Most of Mendelssohn's disciples had already renounced their loyalty to the ceremonial Jewish traditions. The steady contact, even socially, with the non-Jews had made the observance of the many Jewish customs most cumbersome. The absorption of Jews into the professional life of the environment and their being drafted into the armed forces, put practical obstacles into their way of keeping the laws of their religious tradition. In fact, Mendelssohn's theory provided too weak a basis for the validity of the laws. For if the laws were to serve but as a preservative and educational force for the religious truths common to all mankind, it appeared as too cumbersome for reaching a goal which others could attain by far simpler means. Mendelssohn's exposition of Judaism could easily be used as a vindication for conversion to Christianity ; for if the rational basis of all creeds were fundamentally the same, then apostasy lost its undignified character which had stigmatized the renegade in the traditional view. Many, among them children and disciples of Mendelssohn, undertook this step after his death. They were certainly not motivated by merely rational considerations. The disintegration of the traditional mode of life and the collapse of segregating barriers rendered effete their ties with the Jewish sphere of faith and with the Jewish clannishness [10].

This step, however, could not be undertaken by all those who renounced the old Judaism. Many, among them those of independent thought and creativity, abandoned their belief in the traditional tenets and the unconditional observance of the ceremonial law, yet felt strongly about their being a part of Jewish society and acknowledged the influence of Jewish tradition upon them. This group was groping for a new

[10] KATZ, Jacob, *op. cit.*, pp. 46-71.

meaning of their Jewish identity, which resulted in the foundation of a new system of Jewish theology and ethics.

As far as the frame of reference was concerned, these theological and historico-philosophical attempts of Jewish thinkers in the first half of the nineteenth century were indebted to German post-Kantian Idealism. This does not only hold true for the works written in Germany and in German, such as those of Samuel Hirsch (1815-1889), Salomon Formstecher (1808-1889), and Salomon Ludwig Steinheim (1789-1866), but also of the Hebrew writings of Nahman Krochmal (1785-1840) in Galicia. In spite of the differences in the structure of their systems, all these thinkers operate on the same premises. They all share the expressed or tacit dispensation with the traditional concept of the historically unique revelation of law or doctrine. For them, Judaism, like any other religion, presents the result of a historical process. Thus the history of the Jewish religion became a free domain for historical research. For Krochmal as for the historian Heinrich Graetz (1817-1891), who prefaced the study of the historical realia with a historico-philosophical sketch, the philosophical concepts served, in fact, as a kind of introduction and guiding principle for periodic divisions and more or less independent presentation of Jewish history. However, the ultimate goal of research and meditation for both the historian and the theologian remained the philosophical vindication of Judaism. The central concept which played an important function in all these systems was the concept of the spirit. The unfolding of the conscious self-realization of the spirit constitutes the theological destiny of history. The Jewish thinkers set themselves the task to determine the role which Judaism played in the past and was designed to play in the future in the course of this development. As may be easily understood, they show marked deviations from the Christian thinkers of their age. The German philosophers, led by Christian doctrines, had assigned to Judaism the function of a stage transitory to Christianity. Even the secularizing historical philosophers maintained this doctrine in their systems, which actually goes back to patristic concepts. According to these theories, there are several stages and phases in the course of the spirit's unfolding and conscious self-realization. In this process, Judaism was assigned a preparatory function. With the emergence of Christianity, Judaism is treated as a kind of anachronistic feature which has forfeited its historical function. A Jewish theology which was dedicated to the vindication of the *raison d'être* of Judaism, even for the present time, had to reject such an interpretation. Moreover the new Jewish theology, basing itself upon the concepts of Idealist philosophers, reached opposite results. In the historical process of the spirit's self-realization, the decisive role is assigned to Judaism. Judaism contributes the true faith to the world. Although Christianity is recognized as a missionary force for the true

faith—herein the Jewish theologians and historical philosophers follow the great medieval thinkers, particularly Maimonides—it is criticized for having made concessions to pagan customs and elements of thought. Thus only Judaism remains to bear the torch of the true faith. As the ultimate end of this process an era was envisaged which would see the triumph of its truth and the breakdown of separating barriers between the religions. However, this ultimate merger was made dependent upon the self-reflection of Judaism and recognition of its mission in the world, as also upon the self-criticism and purification of Christianity. For the present the separate existence and continuation of the Jewish confessional congregation was regarded as justified, in spite of political emancipation and social assimilation and integration [11].

From the point of view of Jewish history one may sum up the achievement of these philosophical systems, whose validity nobody would want to defend nowadays, as follows : at a time when all other ties of the individual to the Jewish community disintegrated, these systems taught and promoted the consciousness of the peculiar value and meaning of the Jewish identity.

Although this new theology of Judaism proved to be a curb to the centrifugal trends, yet within Jewry it became the expression of a religious schism : for these theories assumed implicitly or explicitly that the observance of the ceremonial law, which even Mendelssohn recognized as the criterion of Jewish identity, had lost its validity entirely or at least in the heretofore absolute sense. These new theologians ascribed to the ritual and ceremonial observances the function of mere symbolic expressions of the faith. The time-honoured concept, according to which the observance of the Law in all its *minutiae* is the *sine qua non* for the religious justification of the Jew, was considered effete.

This theology thus deprived the Jewish religion of its historical basis. Theretofore the rabbi's religious authority derived from his erudition in the Law, his proficiency in the "halachic" literature. By virtue of his scholarship and wisdom the rabbi was capable of solving any cases of doubt and the problems of the religiously conscientious. With the suspension of any obligation towards the Law in the traditional sense, the "halachic" literature could no longer serve as a standard in questions of ritual and law. In fact, the theologians were not only divided on the question of how far the ceremonial law was still applicable to certain details, their embarrassment was of a more fundamental nature. Their break with the Halachah deprived them of the source which invests the rabbi with religious authority. In the course of their discussions about ritual and ceremonial questions they continued studiously to cite from

[11] GUTTMANN, Julius, *op. cit.*, pp. 317-345 ; WIENER, Max, *Jüdische Religion im Zeitalter der Emanzipation* (Berlin, 1933), pp. 114-164.

halachic literature. These quotations, however, were mostly designed to serve as demonstration for the yet tradition-bound Jew that these new-fangled concepts also could be corroborated from the ancient source material. As far as the conscience of the new theologians was concerned, it felt no longer responsible to the authority of the Halachah [12].

In the afore-going account, we have not only circumscribed the embarrassment of the theologians themselves and the source of their differences, but most of all the contrast between them and the traditionalists. To the latter group belonged foremost the masses of the Eastern European pale. Also in certain areas in Germany, the traditional mode of living and basis of faith remained in force. Smaller and larger groups of loyalists survived the age of enlightenment and the new religious trends. And from the second third of the nineteenth century onward the maintenance of religious observance as a matter of principle was not only defended by tradition-bound loyalists, but even found its literary exponents in modern-trained rabbis, led by S. R. Hirsch (1808-1888). S. R. Hirsch may by all rights be considered as the founder of modern Jewish orthodoxy. His mind no less than the minds of his adversaries had also been nurtured on German Idealism. The foundation of his faith remained, however, untouched by the new tendencies. For Hirsch the observance of the laws, of whose divine origin he was deeply convinced, remained the vindication of Jewish identity. The elements of speculative philosophy which he had absorbed, served him for the symbolic interpretation of the details of the commandments and for the propagation of their observance. Hirsch was not only a deeply religious, and despite his militant nature, integrated personality. He was also a highly gifted pamphleteer. By virtue of these gifts, he became the leader of circles which either still persevered in the old faith or had been newly reconverted to it [13].

In the middle of the nineteenth century Jewry presented a religiously divided community, a situation which seemed to defy redintegration. Both sides pressed for a regular schism. Yet there were attempts to mediate. In 1844 a Rabbinical Congress was convoked in Brunswick, which was succeeded by many of its kind in the following years. As a matter of principle, the representatives of all trends were asked to participate in these consultations. There were some who cherished hopes that these congresses would not only reach authoritative decisions on the issues in doubt, but would even succeed in resolving the conflicts. These hopes remained unfulfilled. Orthodox spokesmen stayed away. Even the non-orthodox groups did not reach any agreement among themselves.

[12] WIENER, Max, *op. cit.*, pp. 87-113.

[13] *Ibidem*, pp. 69-83 ; BREUER, Isaac, "Samson Raphael Hirsch", in Leo JUNG, ed., *Jewish Leaders* (New York, 1953), pp. 163-177.

This led finally to a situation in which it was left to the respective communities or individuals to resolve how much of the tradition should be kept, which part was to be deleted, and how the religion was to be adjusted to the *Zeitgeist*. Only the state laws in Central European countries which required membership in a religious body prevented the complete disintegration of the Jewish communities. Despite this compulsion, the development led to a downright separation in two countries, in Germany and in Hungary. Fearing the infringement on their way of life by the majority rule of the reform group, the orthodox sector succeeded in securing for itself the right for the establishment of separatist congregations and state organizations. By all indications it appeared as if the religious conflict had divided Jewry into two hostile camps [14].

The scene of the struggle was, as mentioned, Central Europe. In France, England, Holland, and the United States of America, although there was no lack of tension and conflict, the schism was glossed over in terms of a compromise (France and England), or resulted without much struggle in the establishment of various differing congregations on a basis of their right for free religious assembly (U.S.A.). Chronologically speaking, these movements were limited to the half century between 1830-1880, the age of liberalism, when it looked as if the external social and political pressure upon the Jewish community was about to disappear entirely. The religious traditions seemed to constitute the sole cohesive force within the Jewish community ; therefore anywhere that the religious conflict over these traditions grew acute, the unity of communal life became disrupted. In Russia, where millions of Jewish masses still lived under the political pressure of the Czarist regime, also some of these religious conflicts, imported from the West, became evident in the forties. Although the advocates of reform represented here only a small minority, their clash with the traditionalists found its vehement enough expression in social and literary form. However, the cohesive force of external pressure and the criteria of identifiability like a common language (Yiddish), folkways, etc., which safeguarded a mutual participation, made them so community-minded that thoughts of separatist divisions hardly arose. Alongside the traditionalists there arose a group of secularists within the Jewish society, and beside the religious literature, works of secular enlightenment appeared. This social and literary development resulted in the modern nationalism which emerged after the seventies [15]. A movement dedicated to purely religious or theological problems, groping for new foundations without reference to the traditions, did not

[14] ELLBOGEN, I., *op. cit.*, pp. 92-103.

[15] DUBNOW, S. M., *History of the Jews in Russia and Poland* (Philadelphia, 1918), Vol. II, pp. 111-139, 206-237.

evolve on the Russian scene. At best we may recognize the *Musar* movement, founded in Lithuania by Rabbi Israel Lipkin of Salant (1810-1883), as an original religious creation of the age. Rabbi Israel Salant, firmly rooted in the traditional creed, was much concerned over the disintegration of the religious community, which heretofore had provided the individual with a reliable frame of reference and vouchsafed his traditional mode of life. The new development left the individual, as far as religious backing was concerned, standing on his own. Rabbi Israel tried to promote conscious training in self-discipline and religious awareness for the individual, according a preferential place to ethics. The *Musar* movement saw in the laxity and mechanism of the traditionalists the cause for the secularists' defection. Therefore *Musar* demands constant awareness of all religious values and responsibilities, and a keen sense of the scale of preferences in trivial and important matters alike. Rabbi Israel tried to win disciples in the West, in Germany and France. His influence, however, left its mark mainly in Lithuania, and even there only in those institutions of learning (schools and Yeshivoth) which had been established or affected by his movement [16].

The second half of the nineteenth century did hardly present any new development in the religious realm. Both the reform and the neo-orthodox trend merely consolidated their positions as established earlier in the century. In Judaism, just as in the Christian environment, interest shifted from the religious to the ethical. In Judaism, however, there was a particular reason for this emphasis. With the resurgence of anti-Semitism Judaism became exposed to defamations on account of its alleged particularistic moral doctrines. Quotations from ancient Jewish literature were cited to prove the validity of moral obligation only among Jews ; in their relations with "aliens", the Jews were said to be absolved from many or all obligations. This issue was known to Jewish theologians and educators at the beginning of the nineteenth century. They recognized in the double standard of morality the obverse of Jewish solidarity, to which they had been forced under duress of Ghetto segregation. Much effort had been spent at the time of emancipation to eradicate the traces of such opinions, and to educate the Jewish community to a conduct of universal ethics. At the time of anti-Semitic resuscitation in the eighties, when the issue was raised again, this process of education had already been brought to a successful conclusion. Hence the Jewish theologians and educators became justifiably highly indignant about the renewed charges. A new literary movement set in, which dedicated itself to the demonstration of the purity of Jewish ethics, in order to combat the unfounded charges, and to strengthen Jewish self-respect and morale. These efforts achieved more or less compre-

[16] ELIAS, Josef, "Israel Salanter", in Leo JUNG, ed., *op. cit.*, pp. 199-231.

hensive works on the system of Jewish ethics. The most definite and richly documented compendium of its sort is probably the two volumes work of M. Lazarus (1829-1905) : *Die Ethik des Judentums* (translated by Henrietta Szold in 1891 : *Ethics of Judaism).* However, these books were written under the pressure of social defamation, and by their apologetic tendencies often inflicted injustice upon the historic truth. Thus they did not only defend the universal character of Jewish ethics in the hoary past, the Talmudic period, and the Middle Ages, but often projected into their source material interpretations of the essence of Jewish ethics which clearly stemmed from the particular climate of their own age. The century's greatest Jewish thinker, Hermann Cohen (1842-1918), did much to carry the discussion a stage further [17]. Cohen was the founder and leading proponent of the Marburg school of neo-Kantianism, and his ethical system and religious philosophy derive from that source.

In his systematic presentation of the Jewish religion Cohen insisted upon the inclusion of selected historical source material from Jewish literature. Thus he drew abundantly on the prophets, the psalms, Talmudical passages, and on the writings of Maimonides, the classical representative of medieval religious philosophy. Cohen believed to have thus circumscribed the essential and perennial elements of the Jewish religion. His presentation, therefore, served not only as systematic statement of his position within the trends of the Jewish camp, but also simultaneously as means of combatting intellectual and political anti-Semitism. This philosophical outline of Judaism rendered a considerable service to the Jewish intelligentsia as means for rebuffing the repeated attempts at their conversion, particularly pursued by protestants. According to Cohen's espousal, Judaism was not only consonant with the requirements of the modern mind ; for him and his followers Judaism constituted the most valid religion as far as modern science, contemporary culture, and the teleological prospects for progress were concerned. Nor did Cohen feel any conflict between his Jewish allegiance, and his deep-rooted attachment to German culture and his loyal, though not uncritical, devotion to the German state. Hence he remained an opponent to any national Jewish tendency. Political Zionism meant to him treason committed against the primary message of Jewish religion, particularly against its essential messianic idea which implied a universal eschatology for all mankind. It is characteristic of this interpretation that Jewish identity is not predicated of the mere fact of Jewish birth, but upon the acceptance of definite doctrinal content [18].

[17] GUTTMANN, Julius, *op. cit.*, pp. 342-345.

[18] *Ibidem*, pp. 345-362 ; ROSENZWEIG, Franz, "Introduction" to Hermann Cohen's *Jüdische Schriften* (Berlin, 1924), Vol. I, pp. V-LXIV.

The move towards Jewish nationalism, which occurred in Cohen's days, aimed at the reversal of the latter concept. For the champions of nationalism, the doctrinal content of Judaism was at best of secondary importance. Their native identity with Jewry was an indisputable fact, regardless of their personal attitude towards the historical or traditional elements in Judaism. This platform was often advocated by the nationalist ideologists, as by the essayist Bin Gorion (Michab Joseph Berdyczowsky, 1865-1921) and the Hebrew poet Saul Tschernichowski (1875-1943 ; at a certain phase of his development), who rejected any attachment to Judaism not only in the religious but even in the ideological sense, attempting to substitute for it a kind of Nietzschean cult of power or pro-biblical paganism. Theoretically less pronounced nationalists have declared that the identification with the Jewish nationalist movement would be independent of any kind of religious commitment. In this vein Ahad Haam (Asher Ginzberg, 1865-1927), ideologist of cultural Zionism, preferred the agnostic who regarded the Jewish concept of God as the creation of the Jewish national genius to the traditionalist who accepted the Jewish nation as a Divine creation. Except for its orthodox wing which cherished hopes for the national renaissance of the traditional way of life, the Jewish nationalist movement strove mainly for the creation and revitalization of the formal elements of national existence, like Hebrew as a living tongue, secular literature, national history, and the return to the historical homeland. Yet, even with regard to spiritual interpretations of Judaism, the nationalist movement made valuable contributions. It was Ahad Haam, who on the one hand regarded the Jewish religion as effete, yet upheld his belief in Jewish ethics, which he sought to identify with the aspiration for absolute justice. In fact, there were several attempts to formulate concepts and traits which distinctly mark off Judaism, or rather the Jewish national character from similar phenomena in other ethnic or cultural groups. Like many other nationalist movements, Jewish nationalism based its political claims on traditions of its national culture ; thus even the political orientation effected a strong creative impetus to cultural expression. The problem of Judaism from the religious and ethical aspect which had been the focus of Jewish movements heretofore became a rather confused issue with the nationalists' approach to it, as they raised merely formal national elements to represent absolute values. On the other hand, this orientation inspired a national self-confidence which provided the Jew with a fresh and promising approach towards his own identity problem, for nationalism emancipated the Jewish theoretists from the compulsion for apologetics. Taking his Jewish identity as self-evident instead of presenting a moot problem to himself, he regained his inner balance and freedom. Now it was possible for him to face and take all that had been handed down to him by former

generations without running the danger of either losing his ties with this past, or of having personally to accept the traditional mode of living [19].

As a spiritual force, however, the national idea only became effective at a time which lies beyond the scope of this survey. As a matter of fact, the nationalistic forces have only recently come fully into play. In their present process of passing into history, they are still beyond the historian's ken.

[19] AHAD HAAM, *Essays, Letters, Memoirs*, Introduction by Leon Simon (Oxford, 1946).

II. DOCUMENTATION

LA QUESTION DE L'ORIGINE DES MACÉDONIENS : MISE AU POINT *

Au milieu du V^e siècle avant J.-C., le nom de « Macédoine » (*Μακεδονία*) était donné au pays qui s'étendait du lac Lychnitis (Achride) à l'ouest jusqu'au fleuve Strymon à l'est, et du mont Olympe au sud jusqu'au confluent de l'Axios et de l'Erigôn à peu près au nord [1]. Il devait ce nom à ses habitants, les « Macédoniens » (*Μακεδόνες*), branche importante des « Doriens » [2], qui l'avaient conquis du nord-ouest au sud-est en l'espace de cinq ou six ans [3].

A cette époque, les Macédoniens étaient divisés en divers petits royaumes sous des dynasties nationales [4], dont la plus puissante était celle des « Argéades » (*Ἀργεάδαι*). Les rois de cette famille, installés depuis le début du VII^e siècle à Aigai (Edessa) et plus tard à Pella [5], furent en réalité les agents principaux de la puissance macédonienne. Par des efforts persistants et habiles, ils réussirent à consolider et à étendre leurs possessions, à repousser les attaques de leurs ennemis nationaux Illyriens et Thraces, et à déjouer les tentatives des puissances

* Article recommandé par le Prof. L. Pareti, Directeur du Vol. II.

[1] Cf. Thucydide, II, 99. Pour les détails concernant les limites de la Macédoine ancienne, sa topographie, et sa géographie politique, cf. les références signalées dans Kallέris, *Les anciens Macédoniens*, 1, n. 1 ; cf. aussi la carte jointe à cette étude, et la carte de H. Kiepert, *Formae orbis ant.*, No XVI.

[2] Hérodote, I, 56 ; VIII, 43.

[3] Thucydide, l. c. ; cf. Beloch, *Gr. Geschichte*, I², 1, 341 ; Glotz, *Hist. Gr.*, III, 211-13 ; Geyer, *Maked. bis Philipp*, 35 ss. ; Casson, *Macedonia*, etc., 175 ss.

[4] Cf. Thucydide, II, 80, 99 ; IV, 79, 83 ; Strab., VII, 326 ; IX, 434, etc. Cf. Geyer, *op. cit.*, 77-83 ; Pauly-Wissowa, *Real-Encyclopädie d. kl. Altertumswiss.*, « Makedonia », col. 703-4 ; Kallέris, *op. cit.*, 2.

[5] La date approximative de l'arrivée des Macédoniens à Aigai (en Êmathie) est donnée par Hérodote (VIII, 138-39). Ce fut le roi Archélaos (413-399) qui transporta la capitale à Pella.

grecques du sud (surtout d'Athènes) qui tendaient à les empêcher d'arriver à la mer et aux mines d'or du mont Pangée [6], jusqu'à ce que l'un d'eux, Philippe II, passa à l'offensive et fit de la Macédoine la plus grande puissance européenne de l'époque.

En effet, Philippe (359-336) put en peu de temps supprimer les dynasties macédoniennes régionales, refouler une fois pour toutes les Illyriens chez eux, occuper les colonies grecques du littoral, annexer la Chalcidique et la région située entre le Strymon et le Nestos, conquérir et coloniser une grande partie de la Thrace, et se tourner enfin vers la Grèce du Sud afin de réaliser l'idéal panhellénique : unifier tous les Grecs sous son commandement et faire la guerre de revanche contre les Perses. Les villes grecques démocratiques (Athènes en tête) ont vu là le prétexte sous lequel Philippe cherchait à masquer ses desseins impérialistes et ont voulu résister. Mais il réussit à vaincre les résistances et, après sa victoire décisive à Chéronée (en Béotie), à se faire proclamer à Corinthe (338) chef et généralissime des Grecs unis pour mener la guerre nationale contre la Perse. Il fut assassiné pendant les préparatifs de cette guerre [7], dont la conduite échut à son fils, Alexandre le Grand.

Alexandre (336-323) fut investi par les Grecs, réunis à Corinthe, du même titre et de la même mission que son père ; après avoir soumis les barbares du nord jusqu'au Danube, il passa en Asie, vainquit coup sur coup les Perses et conquit leur empire ; mais il mourut à Babylone à la fleur de l'âge et à l'apogée de la gloire. Avec lui s'éteignit la dynastie des Argéades [8].

Cependant les conquêtes d'Alexandre ont changé la face du monde civilisé d'alors et marqué le début d'une nouvelle époque historique, l'époque « alexandrine » ou « hellénistique » (336-31 avant J.-C.). La caractéristique principale de cette époque fut l'expansion de l'hellénisme dans l'Orient conquis par Alexandre, où de nouveaux royaumes ont été fondés (Egypte, Syrie, Pergame, etc.) par ses généraux macédoniens. Les milliers de Grecs et de Macédoniens, émigrés dans ces royaumes macédoniens, y ont répandu et implanté la langue, la littérature, l'art, la religion, la philosophie, la science et le mode de vie grecs. De cette

[6] On peut trouver l'essentiel sur l'histoire macédonienne de cette période dans GEYER, *Maked. bis Philipp*, 43 ss. ; PAULY-WISSOWA, *Real-Encyclopädie...*, « Makedonia », col. 698 ss.

[7] Cf. A. MOMIGLIANO, *Filippo il Macedone* (Firenze, 1934) ; Fr. WÜST, *Philipp II von Makedonien und Griechenland von 346 bis 338* (München, 1938) ; GEYER, « Philippos » (No 7) in PAULY-WISSOWA, *Real-Encyclopädie...*

[8] Car son frère bâtard Philippe Arrhidée et son fils Alexandre, qu'il eut de Rhoxane, n'ont pas régné pratiquement. De l'immense bibliographie sur Alexandre, je me borne à citer l'étude de U. WILCKEN, *Alexander der Grosse* (Leipzig, 1931), et celle de G. RADET, *Alexandre le Grand* (nouv. réimpr., Paris, 1950).

expansion de la civilisation grecque et des influences inverses qu'y a reçues l'hellénisme est née la civilisation « hellénistique », dont ont hérité en grande partie Rome et Byzance, et, par là, l'Europe moderne [9].

Or, certains savants modernes soutiennent que ces Macédoniens, qui ont fait la guerre contre les Perses au nom de la Grèce et répandu ensuite la civilisation grecque dans les territoires conquis et gouvernés par eux-mêmes, n'étaient pas des Grecs. Le fait qu'Hérodote affirme le contraire ou que toute l'évidence historique connaît des Macédoniens parlant depuis toujours le grec, portant des noms grecs et se comportant en Grecs ne suffit pas à les convaincre. Car il y a, d'autre part, Démosthène qui, dans ses discours politiques prononcés pendant les hostilités entre Athènes et Philippe II, traite celui-ci et ses Macédoniens de « barbares » [10]. Il y a aussi Isocrate qui, dans un discours adressé à Philippe pour l'exhorter à se mettre à la tête des Grecs et aller combattre les barbares, lui rappelle en passant que le fondateur de sa dynastie est parti du Péloponnèse et est allé régner en Macédoine [11], sur des « gens étrangers », parce qu'il n'a pas voulu régner sur des « compatriotes » [12]. Il y a encore Plutarque qui atteste que les Macédoniens employaient un *β (b)* là où les Grecs utilisaient un *φ (ph)* [13]. Tout cela montrerait que les Grecs anciens eux-mêmes considéraient les Macédoniens comme des étrangers et que le parler macédonien différait essentiellement du grec ; que les Macédoniens aient parlé le grec après Alexandre et collaboré avec les Grecs à l'expansion de la civilisation grecque, cela s'expliquerait par le fait qu'ils furent entre temps « hellénisés ».

De cette façon, la science moderne s'est trouvée devant une « question » concernant l'origine ethnique des Macédoniens (« eine Makedonenfrage ») : les Macédoniens étaient-ils des Grecs ou non ? Les opinions des spécialistes furent partagées dès le début : « Oui, sans doute », répondent les uns ; « non », ou « oui, peut-être, mais... », disent les autres. Le premier qui fut de ce dernier avis (et qui a effectivement posé la question) a été l'historien et archéologue allemand Karl-Ottfried Müller (1825). Le premier du camp adverse, qui se chargea précisément de réfuter la thèse du précédent, fut l'historien allemand Otto Abel

[9] A ce sujet, voir les références dans H. BENGTSON, *Gr. Gesch.*, 278, note 2 (Cf. KALLÉRIS, *op. cit.*, 8, note 4).

[10] Cf. plus bas, p. 914, note 65.

[11] Cette généalogie mythique, qui faisait descendre les Argéades de l'Argos du Péloponnèse, de la famille des Téménides, est relatée par HÉRODOTE (VIII, 137), et répétée depuis par d'autres (Cf. THUCYDIDE, II, 99, etc.). A ce sujet, Cf. M. NILSSON, *Cults, Myths, Oracles, and Politics in Ancient Greece* (Lund, 1951), 99 ss. ; KALLÉRIS, *Les anciens Macédoniens*, chap. IV, § 10.

[12] Cf. ci-dessous, p. 915, note 68.

[13] Aetia Graeca 9 (=Moral., 292 e) : ... οὐ γάρ ἀντὶ τοῦ φ τῷ δ χρῶνται Δελφοί, καθάπερ Μακεδόνες, < Βίλιππον > καὶ < Βάλακρον > καὶ < Βερενίκην > λέγοντες, ἀλλ' ἀντὶ τοῦ π...

(1847). Depuis lors, la discussion s'est animée et bientôt généralisée pour deux raisons essentielles [14].

D'abord, à cause de l'importance scientifique que présente une telle question. On ne peut évidemment pas aborder la période historique qui commence avec Alexandre et finit avec Auguste, dans son ensemble ou sous un de ses aspects, sans prendre auparavant position sur cette question. Car du choix que l'on fera entre l'opinion que les Macédoniens étaient un peuple grec — comme les Thessaliens par exemple, ou les Béotiens — et l'opinion contraire que les Macédoniens étaient un peuple étranger aux Grecs — comme les Romains, par exemple, ou les Illyriens — dépendra nécessairement la conception que l'on devra se faire de la bataille de Chéronée, de l'union panhellénique scellée à Corinthe, de la guerre nationale contre les Perses, des conditions de la vie dans les royaumes hellénistiques et de la civilisation qui s'y est développée [15].

Ensuite, parce que les linguistes ont réussi à transformer, à partir d'un certain moment, la question de l'origine ethnique (« Nationalitätsfrage ») en une simple question de langue (« Sprachfrage »), sous prétexte que seul l'examen linguistique peut offrir une réponse valable à la question de la nationalité des Macédoniens, comme de tout peuple primitif [16]. Donc, pour eux, la question était de savoir si le macédonien était un dialecte grec ou une langue différente du grec. Pour en décider, ils ne disposaient malheureusement pas de textes ou d'inscriptions en « dialecte » ou en « langue » macédonienne [17] ; par conséquent, ils se mirent à étudier les « gloses » macédoniennes, à savoir les mots macédoniens archaïques, conservés par les lexicographes byzantins, surtout par Hésychius ; et comme plusieurs de ces mots sont de nature incertaine ou difficile [18], ils furent obligés de se livrer à de longues explications et à diverses hypothèses ; ainsi, la discussion fut engagée surtout entre linguistes, ce qui a contribué à l'embrouiller et à la faire dévier, comme on le verra dans le bref aperçu qui suit.

Il faut noter auparavant un point sur lequel tous les linguistes sont tombés d'accord : l'emploi des sonores, *β, δ, γ (b, d, g)* en macédonien à

[14] Il y a eu malheureusement d'autres raisons, qui ne sont pas du domaine scientifique. Cf. BELOCH, *Gr. Gesch.*, I², 2, 43-44 ; IV², 1, 1 n. 1 ; GLOTZ, *Hist. Gr.*, III, 209 ; KRETSCHMER, *Glotta*, XVI (1928), 172 ; KALLÉRIS, *op. cit.*, 36 ss.

[15] Cf. BELOCH, dans GERCKE-NORDEN, *Einl. in d. Altertumswiss.*, III², 156 : « Die Frage nach den Nationalität der Makedonen ist das Grundproblem der ganzen griechischen Geschichte seit Philipp ; hängt es doch von der Art, wie wir sie beantworten, ab, ob wir Philipp als fremden Eroberer in der Art, wie später die Römer, oder vielmehr als den Einiger und Retter der griechischen Nation auffassen sollen ». Cf. aussi GEYER, *Maked. bis Philipp*, 31-32, etc. (Pour les détails, cf. KALLÉRIS, *op. cit.*, 47 ss.)

[16] Cf. KRETSCHMER, *Einl.*, 288, 293 ; MEILLET, *Aperçu d'une histoire de la langue grecque*³, 59.

[17] Les inscriptions macédoniennes connues jusqu'à présent, et les fragments de textes écrits par des Macédoniens sont postérieurs à Philippe II et rédigés en attique ou en koinè hellénistique (Cf. plus bas, note 52).

[18] A ce sujet, cf. KALLÉRIS, *op. cit.*, 58 ss.

la place des aspirées, *φ, θ, χ (ph, th, kh)* du grec. En vérité, les documents ne sont pas également décisifs sur l'emploi de ces trois consonnes. L'emploi du *β* au lieu du *φ* est fondé sur le témoignage de Plutarque qu'on vient de citer, confirmé par des témoignages analogues des lexicographes byzantins [19] ; l'emploi du *δ* au lieu du *θ* a été dégagé par les linguistes modernes d'un exemple de Plutarque également, corroboré par deux gloses d'Hésychius [20] ; pour l'emploi du *γ* à la place du *χ* il n'existe pas de témoignage ou d'exemple ancien ; il a été pourtant enregistré par les modernes à force de raisonnement que l'emploi d'une seule aspirée en macédonien constituerait une exception inexplicable du point de vue linguistique [21]. Complété ainsi, ce phénomène a toujours été considéré par les linguistes comme une « loi » phonétique du macédonien et comme sa « caractéristique » fondamentale [22].

Voici maintenant les points de controverse.

1. *Le nombre d'exemples servant à confirmer cette « loi » du macédonien.* — Il existe deux groupes d'exemples, « anciens » et « modernes », pour ainsi dire. Les premiers sont transmis par les lexicographes anciens, les seconds furent établis par les linguistes modernes. Ceux-ci ont rejeté ceux des exemples du premier groupe qui sont visiblement dus à des étymologies fantaisistes des grammairiens anciens [23], mais ont suivi la même méthode pour les remplacer. En effet, grâce à des étymologies plus ou moins aventureuses, ils ont pu découvrir un grand nombre d'exemples parmi les gloses d'Hésychius, macédoniennes ou non, comme

[19] Ainsi que « *Βέροια* pour *Φέροια* (la ville de Macédoine), *Κεβαλῖνος* pour *Κεφαλῖνος* (nom d'un officier macédonien), *Βρύγες* pour *Φρύγες* (les « Phrygiens »), *βύκτας* pour *φύκτας* (les vents « mugissants »), *ἀβροῦτες* pour *ὀφρῦες* (les « sourcils »), *κεβλή* ou *κεβαλή* pour *κεφαλή* (la « tête »), *ζάζω* pour *φάζω* (« dire, parler »), *καλύβη* pour *καλύφη* (la « hutte »). Cf. Steph. Byzant., s. v. *Βέροια* ; Etym. Magn., s. v. *Ἀφροδίτη, Βέροια, καλύβη* ; Etym. Gud., s. v. *Ἀφροδίτη* ; Anecd. Gr. Oxon. (Cramer), II, 456, 27 ; Suid., s. v. *κεφαλή* ; Hésych., s. v. *ἀβροῦτες* ; Eustathe de Thessalonique, ad Hom. *ι*, 190, p. 1654, 15 (Pour les détails, cf. KALLÉRIS, *op. cit.*, 359, nn. 2, 3, 4 ; 381, nn. 2, 3).

[20] PLUTARQUE, *De aud. poetis*, 6 (= Moral., 22 c) : « ... ἐκεῖνο μὲν γὰρ φιλόλογον καὶ οὐκ ἀηδές ὅτι « ῥιγεδανή » κακοθάνατος ἐστιν εἰδέναι, « δάνον » γάρ Μακεδόνες τὸν θάνατον καλοῦσι. » HÉSYCH., s. v. *δδραία· αἰδρία*. Μακεδόνες — *δανῶν·* κακοποιῶν. κτείναν. Μακεδόνες. (Cf. aussi, Etymol. Magn., s. v. *ἐέλδωρ* ... Παρὰ τὸ *θέλω*, τοῦ θ τραπέντος εἰς δ, κατὰ Μακεδόνας, καὶ ὑπερθέσεως γενομένης, οἷον. *θέλω, δέλω, ἔλδω*. Cf. ci-dessous, note 63.

[21] Cf. KRETSCHMER, *Wochenschr. f. kl. Philol.*, XIV (1897), 1107.

[22] Cf. G. MEYER, *Jahrbuch f. kl. Philol.*, CXI (1875), 191 ; F. BLASS, *Ausführl. Gramm. d. gr. Sprache*, I, 23 ; KRETSCHMER, *Einleitung in d. Geschichte d. gr. Sprache*, 287 ; *Glotta*, XVI (1928), 173 ; HIRT, *Die Indogerm.*, I, 147 ; *Handbuch d. gr. Laut- u. Formenlehre*, 2, 30 ; A. THUMB, *Handbuch d. gr. Dialekte*, 9 ; HOFFMANN, *Maked.*, 232 ; PAULY-WISSOWA, *Real-Encyclopädie d. kl. Altertumswiss.*, « Makedonia », col. 693 ; G. HATZIDAKIS, *Z. Abstamm. d. alt. Maked.*, 35 ; *Ἀκαδημ. Ἀναγν.* I², 30 ; MEILLET, *op. cit.*, (2ᵉ édit.), 36 ; SCHWYZER, *Griech. Gramm.*, 69, etc. (Cf. KALLÉRIS, *op. cit.*, 367, note 1).

[23] Ainsi, personne (sauf STURZ et O. MÜLLER) ne cite les exemples de *ζάζω, ζύκτας, καλύβη, δέλω*, tandis qu'il en est qui font un choix parmi les autres exemples (Cf. plus haut, notes 19, 20), sans donner la raison de ce procédé arbitraire (Cf. KALLÉRIS, *op. cit.*, 357-61, 395-97, 421, n. 1, 424, n. 1).

parmi les noms propres macédoniens ou supposés tels [24], sans réussir d'ailleurs à se mettre d'accord sur la valeur démonstrative que comporterait chacun de ces nouveaux exemples [25].

2. *L'origine de ce phénomène du macédonien.* — Un groupe de linguistes croit que les sonores non aspirées *b, d, g* du macédonien viennent des sonores aspirées *bh, dh, gh* de l'indo-européen par chute de l'aspiration, comme en thraco-illyrien et dans les langues européennes du nord-ouest, alors qu'en grec elles furent changées en sourdes aspirées *ph, th, kh* [26]. Mais un autre groupe de linguistes pense que cette conclusion n'est pas conforme aux données scientifiques [27] ; on doit donc supposer, selon eux, que le macédonien, originellement dialecte grec, a été séparé et isolé des autres dialectes à une époque où tout le grec employait encore les sonores aspirées indo-européennes *bh, dh, gh* ; en raison de cet isolement et de l'influence exercée sur lui par le thraco-illyrien, il a plus tard changé ces sonores aspirées en non aspirées [28]. Cependant, un troisième groupe de spécialistes soutient que les mots macédoniens avec une sourde aspirée, et surtout le mot macédonien *κεβαλή* [29] suffisent à montrer que les sonores aspirées *bh, dh, gh* furent d'abord changées en sourdes aspi-

[24] M. Schmidt, l'éditeur d'Hésychius, a inauguré cette méthode ; il a prétendu que quatre gloses macédoniennes du lexicographe contenaient des exemples d'emploi d'une sonore à la place d'une aspirée grecque (*δδῆ* « ciel », *γόδα* « intestins », *Δάρδων* « dieu de la santé ? », *δώρας* « rate ») et qu'une dizaine de ses gloses anonymes sont « macédoniennes » parce qu'elles ont (ou sont censées avoir) une sonore au lieu d'une aspirée grecque. D'autres linguistes ont adopté ces conjectures, et continué dans la même voie ; ils ont pu ainsi ajouter une dizaine de noms communs et quelque cinq ou six noms propres au premier groupe, et une vingtaine de noms communs avec cinq noms propres au second groupe — tous gratuits bien entendu, autant que ceux de Schmidt (Cf. Kallέris, *op. cit.*, 361-66).

[25] La preuve en est que chacun en emploie une liste de son choix (Cf. Kallέris, *op. cit.*, 60 n. 2, 393-94).

[26] Cf. Hirt, *Die Indogerm.*, I, 149 ; *Handbuch d. gr. Laut- u. Formenlehre*², 30 ; Thumb, *Handbuch d. gr. Dialekte*², 9 ; A. Debrunner, dans Ebert's *Reall. d. Vorgesch.*, IV, 516, etc.

[27] Par exemple, les nombreux éléments, nettement grecs et en même temps originaux, que comprend le vocabulaire macédonien connu (Cf. plus bas, note 45), la forme purement grecque des mots macédoniens comportant une sonore au lieu d'une aspirée grecque (Cf. ci-dessus notes 19, 20), le fait que les Thraco-Illyriens remplaçaient les aspirées grecques ph, th, kh, par p, t, k, et non par b, d, g, etc. (Cf. les références de la note suivante).

[28] Ainsi Kretschmer, *Einleitung*, 288 ; dans Gercke-Norden, *Einleitung in d. Altertumswiss.*, I³, 6, 87 ; *Glotta*, XII (1923), 281 ; XXII (1934), 101 ss. ; Walde, *Zeitschrift f. vergl. Sprachforsch.*, XXXIV (1897), 475 ; Blass, *Ausführl. Gramm. d. gr. Sprache*, I, 23/24 ; Schwyzer, *Gr. Gramm.*, 70-71, etc.

[29] Il existe en effet des mots contenant une sourde aspirée, tant parmi les gloses macédoniennes (*ἄγχαρμον, ἀρφύς, δμιάχαι, ζέρεθρον, θαῦλος, θούριδες, χάρων, χλαμύς*), que parmi les noms propres macédoniens (*Ἀντίοχος, Ἀρχέλαος, Ἀμφοτερός, Φιλώτας, Ἀγάθων, Θρασέας*, etc.). Quant au mot *κεβαλή* (ou *κεβλή*, cf. ci-dessus note 19), son *κ* initial montrerait que les sonores aspirées indo-européennes n'ont pas été changées en sonores non aspirées en macédonien ; car, dans ce cas, la forme *ghebhala* devrait donner *gebala* et non *kebala* (*κεβαλά*) ; donc, *ghebhala* aurait été d'abord changée en *khephala*, comme ailleurs en grec, puis en *kephala* et ensuite en *kebala* (Cf. les références de la note suivante).

rées *ph, th, kh* en macédonien, comme partout ailleurs en grec, et que plus tard l'une ou l'autre de celles-ci se changea en sonore non aspirée, par suite de l'influence que la prononciation des éléments thraco-illyriens, conquis et incorporés par les Macédoniens, a exercée sur le parler des classes populaires de ceux-ci [30]. Les partisans de la thèse opposée ont évidemment cherché à réfuter ces arguments [31], d'autres ont répondu aux réfutations [32], et finalement chacun est resté sur ses positions.

3. *Les mots « macédoniens » en général.* — Peu de linguistes ont cherché à se former une opinion sur le caractère du macédonien en procédant à un examen détaillé de tous les mots macédoniens connus par les sources [33]. La plupart d'entre eux se sont bornés à les juger d'une manière sommaire [34] ; il leur a suffi de citer les mots qui montreraient que le macédonien différait ou ne différait pas phonétiquement du grec puisqu'il employait, selon eux, les sonores à la place des aspirées de celui-ci. De là des divergences d'opinion en ce qui concerne le nombre de mots vraiment macédoniens [35], l'étymologie de l'ou ou l'autre de ceux-ci [36], ou l'importance démonstrative des uns plutôt que des autres [37].

[30] Cf. HATZIDAKIS, *Zur Abstammung der alten Makedonier*, 35-37 ; *Indogerm. Forschungen*, XI (1900), 318 ; A. FICK, *Bezzenberger's Beiträge z. Kunde d. i-g. Sprachen*, XXIV (1899), 297 ; *Zeitschrift f. vergl. Sprachforsch.*, XLII (1909), 147 ; F. SOLMSEN, *Berl. Philol. Wochensch.*, 1907, 274 ; LESNÝ, *Zeitschrift f. vergl. Sprachforsch.*, XLII (1909), 300 ; *Real-Encyclopädie d. kl. Altertumswiss.*, « Makedonia », col. 693, etc.

[31] Cf. THUMB, *N. Jahrbuch f. kl. Altertum*, X (1907), 77-78 ; HIRT, *Die Indogerm.*, II, 603 ; KRETSCHMER, *Glotta*, XVI (1928), 173 ; *Wien. Prähistor. Zeitschrift*, XIX (1932), 276-77 ; *Glotta*, XXII (1934), 101-2.

[32] Cf. V. PISANI, *Revue Internationale d'Etudes Balkaniques*, III (1937), 11-25 ; Ant. MAYER, *Glotta*, XXXI (1951), 114-20.

[33] Surtout O. HOFFMANN (*Die Makedonen...*, 37-111 ; *Real-Encyclopädie d. kl. Altertum.*, « Makedonia », col. 691-95), et moins complètement, A. FICK (*Zeitschrift f. vergl. Sprachforsch.*, XXII, 1874, 193-215), et V. PISANI (*op. cit.*, III, 1937, 8-31) ; cf. aussi F. G. STURZ, *De Dialecto Macedonica et Alexandrina liber*, 35-50.

[34] G. MEYER, *Jahrbuch f. kl. Philol.*, CXI (1875), 185-92 ; HATZIDAKIS, *Zur Abstammung der alten Makedonier*, 5-38 ; HIRT, *Die Indogerm.*, I, 148-51 ; *Handbuch d. gr. Laut- u. Formen.* [2], 29-30 ; KRETSCHMER, *Einleitung...*, 285-8 ; dans GERKE-NORDEN, *Einleitung in d. Altertumswiss.*, I [3] 6, 87 ; F. BLASS, *Ausführl. Gramm. d. gr. Sprache*, I, 23-24 ; THUMB, *Handbuch* [2], 8-9 ; MEILLET, *Aperçu d'une histoire de la langue grecque* [3], 58 ; NEHRING, *Reall. d. i.-g. Altertumskunde*, « Makedonen » ; DEBRUNNER, dans EBERT's *Reall. d. Vorgesch.*, IV, 516 ; SCHWYZER, *Griech. Gramm.*, I, 69-71, etc. (Pour les détails, voir KALLÉRIS. *Les anc. Macédoniens*, 22-29, 278-87).

[35] On y ajoute par exemple différents mots, dont la qualité macédonienne n'est nulle part attestée (Cf. plus haut, note 24), tandis qu'on en retranche d'autres dont l'origine macédonienne est confirmée par les sources (Cf. KALLÉRIS, *op. cit.*, 58-66).

[36] Cf. ci-dessus, note 24 (pour les détails, cf. KALLÉRIS, l. c., 66 ss.).

[37] Pour tout exemple concret, voici une opinion compétente et équitable : « ... es ist mit diesen Glossen ein eigenes Ding : jeder liesst heraus, was seiner vorgefassten Meinung entspricht. Wer die Makedonen für Barbaren hält, erklärt alle Glossen, die sich aus dem Griechischen deuten lassen, für griechische Lehnwörter ; wer der entgegengesetzten Ansicht ist, weisst daraus hin, dass in dem Dialekt eines Grenzvolkes, wie es die Makedonen waren, natürlich manches Wort aus der Sprache der benachbarten Barbaren eindringen musste ... » (BELOCH, *Hist. Zeitschrift*, 2. Reihe, XLIII (1897), 202. Cf. KALLÉRIS, l. c., 280-84).

4. *Les noms propres macédoniens.* — Peu de linguistes également ont étudié à fond l'onomastique macédonienne [38], tandis que personne ne s'est sérieusement occupé de la toponymie. On pense que l'une et l'autre n'ont qu'une valeur accessoire dans la discussion relative au macédonien [39]. Ainsi, chacun se contenta de les juger sommairement de son point de vue, ou d'envisager séparément l'un ou l'autre anthroponyme ou toponyme qu'il croyait capable d'étayer son opinion [40].

Il va de soi que les conclusions ethnologiques auxquelles ont abouti les linguistes reflètent fidèlement leurs divergences linguistiques : pour les uns, les Macédoniens étaient un peuple grec ou apparenté aux Grecs et mélangé par la suite d'éléments thraco-illyriens [41] ; pour les autres, ils étaient un peuple illyrien ou apparenté aux Thraco-Illyriens, mélangé par la suite d'éléments grecs ou gréco-thraces, et finalement « hellénisé » [42].

Cependant la controverse linguistique a également influencé la discussion entre historiens. Il en est, bien entendu, qui ont refusé d'attribuer aux arguments des linguistes plus d'importance que le leur assigne l'examen de l'ensemble des données concernant la question ; pour ceux-ci, cet examen conduit à la conclusion que les Macédoniens étaient un peuple grec, dont le parler présentait des particularités dialectales ordinaires [43]. Mais il en est aussi qui ont adhéré aux conclusions des linguistes et parlé de « parentés » ou de « mélanges » entre Gréco-Macédoniens et Thraco-Illyriens, ou entre Illyriens-Macédoniens et Grecs ou Gréco-Thraces, et d'autres encore [44]. Pour les premiers, la prétendue « hellénisation » des Macédoniens n'a jamais eu lieu dans la réalité ou

[38] D'abord Fick, un peu sommairement (*Zeitschrift f. vergl. Sprach.*, XXII, 216-35), puis Hoffmann, plus systématiquement (*Die Makedonen...*, 116-231), et enfin I. Russu, avec partialité (*Ephem. Dacorom.*, VIII, 1938, 163-221). Cf. Kallέris, *ibid.*, 289, n. 3.

[39] Cf. Hoffmann, *Die Makedonen...*, Vorwort, p. IV/V ; Fick, *Wochenschrift f. kl. Philol.*, 1906, 1281-82 ; Solmsen, *Berl. Philolog. Wochenschrift*, 1907, 273 ; Thumb, *N. Jahrbuch f. kl. Altertum*, X (1907), 77 ; Kretschmer, *Götting. Gelehrte Anzeig.*, 1910, 71 (Cf. Kallέris, *op. cit.*, 304 ss.).

[40] Cf. Kretschmer, *Einleitung in d. Gesch. d. gr. Sprache*, 286 ; *Glotta*, XXII (1934), 113 ss. ; Hoffmann, *Die Makedonen*, 257-58 ; Solmsen, *Zeitschrift f. vergl. Sprachforsch.*, XXXIV (1897), 550-51 ; Krahe, *Zeitschrift f. Ortsnamen-Forschung*, XI, 1935, 79-102, etc. (Cf. Kallέris, l. c., 294 ss).

[41] Ainsi Sturz, Fick, Hatzidakis, Hoffmann, Solmsen, Buck, Kretschmer, Lesný, Pisani, Schwyzer, A. Mayer, etc. (Pour les nuances et les détails, cf. Kallέris, *op. cit.*, 21-29, 391, note 1).

[42] Ainsi G. Meyer, Hirt, Thumb, Meillet, Debrunner, Krahe, von Blumenthal, etc. (Cf. Kallέris, l. c.).

[43] A savoir, K. J. Beloch, Ed. Meyer, G. Glotz, J. B. Bury, G. de Sanctis, U. Wilcken, M. Holleaux, A. Wilhelm, Fr. Geyer, H. Berve, P. Giles, F. A. Wright, E. Bevan, S. Casson, H. Bengtson, E. Pais, etc. (Cf. Kallέris, *op. cit.*, 31.).

[44] Comme J. Kaerst, P. Roussel, P. Jouguet, W. Tarn, A. Pickard-Cambridge, Fr. Lehmann-Haupt, E. Kornemann, A. Jardé, J. Hatzfeld, etc. (Cf. Kallέris, *ibid.*, 32-34).

indique simplement la prompte réadaptation de ceux-ci à la civilisation hellénique de l'époque classique ; pour les seconds, l'« hellénisation » des Macédoniens a été réalisée par l'influence des colonies grecques voisines ou par les soins des Argéades philhellènes et achevée à l'époque de Philippe et d'Alexandre.

Voyons pourtant les faits.

1. Les noms communs macédoniens sont en général grecs par la racine, la forme et le sens [45], mais aussi notablement idiomatiques, ce qui prouve leur caractère autochtone [46].

2. Les noms macédoniens de personnes sont de racine et de forme grecques [47], mais en même temps originels et idiomatiques [48].

3. Le nom ethnique, que portait depuis toujours le peuple macédonien, est purement grec [49].

4. La plupart des toponymes macédoniens sont d'origine et de forme grecques [50] ; les autres sont toujours au moins de forme grecque, même lorsque la racine est douteuse ou non grecque [51].

[45] A condition qu'on les examine sans parti pris, c'est-à-dire sans l'idée préconçue que le macédonien était différent du grec (Cf. KALLÉRIS, *op. cit.*, 280, et note 1), ou qu'il employait une sonore partout où le grec utilisait une aspirée (Cf. ci-dessus, note 24). Il y en a naturellement qui sont d'étymologie difficile ou incertaine, et deux ou trois qui sont de racine non grecque (Cf. KALLÉRIS, *op. cit.*, 278-80), mais cela se voit dans tout autre dialecte grec, surtout en matière de gloses ; cependant, la grande majorité de ces mots (c'est-à-dire neuf sur dix) suffit à montrer le caractère grec du vocabulaire macédonien.

[46] Parce qu'ils désignent des objets, des animaux, des institutions politiques ou militaires, sous une forme ou un sens qu'on ne retrouve pas ailleurs en Grèce (Cf. KALLÉRIS, *op. cit.*, 285-88).

[47] A savoir, les noms des rois, des princes, des nobles, des particuliers (hommes et femmes), bien nombreux d'ailleurs, sont grecs (Cf. KALLÉRIS, l. c., 291, notes 1, 3, 5, 9) ; les prétendues exceptions tiennent d'ordinaire à des étymologies fautives des linguistes modernes (Cf. *ibid.*, 295-97).

[48] Parce qu'il en est qui ne se rencontrent pas ailleurs en Grèce avant les conquêtes macédoniennes, d'autres qui sont connus uniquement par l'épopée, d'autres qui présentent la caractéristique du redoublement expressif de la consonne d'une syllabe, et d'autres (la plupart) qui sont de formation idiomatique, notamment dorienne (Cf. KALLÉRIS, l. l., 292-93, 320-24).

[49] *Μακεδόνες* ou *Μακεδνοί* signifie « (hommes) de haute taille, élancés ». (Cf. BOISACQ, *Dictionnaire étymologique de la langue grecque*, 3e édit., s.v. *μακεδνός* ; HOFFMANN, *Die Makedonen*, 219 ; SCHWYZER, *Gr. Gramm.*, 69 ; 489 ; etc.).

[50] Comme les noms des plus importantes villes (Αἰγαί, Ἀλκομεναί, Ἄργος, Ἀταλάντη, *Δῖον, Εἰδομένη, Ἐδεσσα, Ἡράκλεια, Θέρμα,* Ἴχναι, *Κύρρος, Πέλλα, Χαλάστρα,* etc.), les noms des fleuves (*Ἀλιάκμων, Ἀξιός, Βόρβορος,* Ἔνιπεύς, Ἐργιγών, Ἐχεῖδωρος, *Σῶς,* etc.) (Cf. KALLÉRIS, l. l., 299-302 ; à noter que les noms des colonies que les Macédoniens ont fondées en Macédonie orientale, en Thrace, en Syrie, et ailleurs, sont aussi grecs ; cf. *ibid.*, 301, n. 2).

[51] C'est ce qu'on voit d'ailleurs dans toute autre région grecque au Sud de l'Olympe (Cf. KALLÉRIS, l. c., 305-6).

5. Les Macédoniens n'ont jamais parlé ou écrit une autre langue que le grec [52].

6. Ils n'ont aussi adoré d'autres dieux que ceux des Grecs [53] ; leur calendrier d'origine grecque, mais assurément indigène, en offre une preuve de plus [54].

7. De même, ils n'ont pas eu d'institutions politiques ou de mœurs et coutumes étrangères à celles des Grecs [55].

8. Au contraire, ils se distinguaient par là, comme par tout le reste, des Illyriens et des Thraces [56].

[52] Les faits suivants suffisent à le prouver : (1) Les Macédoniens, « hellénisés » d'après certains savants modernes, n'ont pourtant rien laissé de leur langue nationale ; ce qui serait absurde pour un peuple vainqueur et fier, plus que tout autre, de sa nationalité particulière, et d'autant plus que d'autres peuples, étrangers aux Grecs et vraiment hellénisés dans la suite (Thraces, Cariens, Phrygiens, etc.), ont trouvé le moyen de laisser des traces visibles de leurs langues nationales bien que leur vie historique ne soit en rien comparable à celle des Macédoniens ; (2) les rois macédoniens ont pu de bonne heure (dès la fin du Ve siècle) adopter l'attique comme langue officielle ; ce qui serait également absurde si leurs sujets ne pouvaient lire et comprendre l'attique, devenu langue commune entre Grecs parlant différents dialectes ; (3) les hommes de lettres illustres de toute la Grèce fréquentaient la cour macédonienne depuis le milieu du Ve siècle, au moins ; (4) à la fin de ce siècle déjà, l'un d'eux, le poète Euripide, faisait jouer ses tragédies en Macédoine ; (5) les œuvres littéraires écrites par des Macédoniens et destinées évidemment aux Macédoniens surtout (et non seulement aux Grecs), étaient rédigées en grec (Cf. KALLÉRIS, *op. cit.*, chap. I, § 10).

[53] Les monnaies et les inscriptions macédoniennes s'accordent avec la tradition littéraire pour affirmer que tous les dieux du panthéon hellénique avaient leur culte en Macédoine, comme partout ailleurs en Grèce ; la pratique culturelle des Macédoniens ne différait d'ailleurs pas de celle des autres Grecs. (Cf. W. BAEGE, *De Macedonum sacris*, Hal, 1913, 1 ss. ; KALLÉRIS, *op. cit.*, chap. III, §§ 2, 3 et 4).

[54] Les fêtes macédoniennes portaient des noms grecs ; les mois aussi ; certains de ces derniers se rencontraient dans le calendrier d'autres villes grecques (*Δῖος, Ἀπελλαῖος, Ἀρτεμίσιος, Δαίσιος, Πάναμος*), mais les autres (*Αὐδναῖος, Περέτιος, Λῶος, Γορπιαῖος, Δύσθρος, Ξανδικός, Ὑπερβερεταῖος*) y étaient inconnus ; du reste, l'ensemble du calendrier n'était pas connu hors de Macédoine avant l'époque hellénistique ; ce qui prouve son ancienneté et son originalité (Cf. BAEGE, *op. cit.*, 220-28 ; M. NILSSON, *Die Entst. und relig. Bedeutung d. gr. Kalenders*, 56 ; KALLÉRIS, l. c., § 5).

[55] Le régime de la royauté féodale de l'époque héroïque de la Grèce fut maintenu en Macédoine, à peu près comme à Sparte, en Épire, et jusqu'à un certain moment en Thessalie. Le roi gouvernait d'après des lois traditionnelles. Les nobles du pays constituaient les « compagnons » (*ἑταῖροι*) du roi, comme aux temps homériques, ou ses « gardes du corps » (*σωματοφύλακες*), comme dans la Sparte historique. L'assemblée du peuple libre en armes gardait des privilèges antiques qui limitaient les prérogatives de la royauté et de la noblesse. Les villes jouissaient d'une liberté municipale, distincte du pouvoir royal. Les gymnases et les théâtres y jouaient le même rôle que dans les villes grecques du Sud. Le costume était essentiellement grec. La vie familiale et privée ne différait pas de celle des autres Grecs (Cf. KALLÉRIS, *op. cit.*, chap. III).

[56] Tant le régime politique — sous lequel vivaient les tribus illyriennes et thraces — que les mœurs et coutumes, le culte, le costume, le langage, complètement différents de ceux des Macédoniens, contribuaient à maintenir et à alimenter le sentiment de haine nationale qui séparait toujours ceux-ci des Thraco-Illyriens (Cf. Diod., XVIII, 11, 1 ; Arrien, *Anab.*, VII, 9, 3 ; Polybe, XXVIII, 8, 9 ; J. KAERST, *Geschichte d. Hellenism.*, I [3], 160 ; KALLÉRIS, *op. cit.*, chap. IV, § 8).

9. Les peuples étrangers de l'Asie et de l'Afrique les ont toujours considérés comme Grecs [57].

10. Les Grecs ont souvent proclamé cette identité de race [58].

11. Les Macédoniens eux-mêmes se disaient Grecs [59].

Devant ces faits historiques, la plupart des savants n'hésitent pas, comme on l'a vu, à reconnaître que les Macédoniens étaient un peuple grec. Ceux qui ont des doutes ou qui sont d'un avis différent, s'appuient sur les trois autres arguments déjà signalés, qu'ils croient capables de mitiger ou de contrebalancer les données que l'on vient d'énumérer, à savoir : 1. l'emploi des sonores β, δ, γ, en macédonien au lieu des aspirées φ, θ, χ, du grec ; 2. le témoignage de Démosthène ; 3. le témoignage d'Isocrate. Pourtant, aucune de ces assertions ne peut peser sur la réalité historique ; car toutes les trois sont fausses, chacune pour des raisons différentes évidemment.

La première est le résultat des méthodes étymologiques en vigueur chez les grammairiens de l'époque gréco-romaine et byzantine. Pour ces spécialistes, il n'y avait pas de doute que le changement d'une lettre en une autre, qu'on pouvait remarquer (à propos d'une étymologie) sur un mot appartenant à un dialecte de l'époque classique, constituait un phénomène général du dialecte en cause, et que tout autre mot, dont l'étymologie présumée exigeait ce changement de lettres, appartenait à ce même dialecte. En application de ces principes, ils ont attribué à tel ou tel des dialectes anciens différents « changements » (ou « emplois ») de lettres complètement imaginaires et une foule de mots qui ne leur appartenaient pas [60].

Un de ces grammairiens a cru que le nom macédonien *Βερενίκη* venait de *Φερενίκη* et il a conclu, en conséquence, que « les Macédoniens changeaient le φ en β » ; ensuite, d'autres ont reconnu le même phénomène « macédonien », à propos de l'étymologie de divers mots et ont répété (comme Plutarque) la « règle » sur le « changement » du φ en β (ou sur « l'emploi » du β au lieu du φ), en l'accompagnant de quelques exemples qui la confirmaient. Mais il faut noter que, ce faisant, ils

[57] Ainsi, les Perses, les Hindous, les Juifs, les Egyptiens, les Carthaginois, qui connaissaient évidemment les Grecs avant d'avoir connu les Macédoniens, ont toujours identifié les uns avec les autres (Cf. KALLÉRIS, l. c.).

[58] Lorsque la passion politique n'influençait pas leur opinion, les Grecs reconnaissaient volontiers que les Macédoniens étaient « du même sang et de la même langue » qu'eux-mêmes (Cf. M. HOLLEAUX, *Rome, la Grèce et les monarchies hellénistiques*, 17 ss. ; 272-73 ; KALLÉRIS, l. l., § 9).

[59] Depuis Alexandre Ier (guerres médiques) qui se proclamait Hellène (HÉRODOTE, V, 22 ; IX, 45), plusieurs autres Macédoniens, rois et particuliers, ont eu l'occasion de déclarer la même chose (Cf. KALLÉRIS, l. l., § 10).

[60] A ce sujet, cf. KALLÉRIS, *op. cit.*, 440-446.

étaient sûrs qu'il s'agissait là, comme partout ailleurs, d'un phénomène grec dialectal ; la preuve en est qu'ils surent le retrouver non seulement dans des mots macédoniens, mais aussi dans des mots homériques ou poétiques en général [61]. C'est dans ce même esprit « grammatical » que Plutarque a pu constater que l'homérique *ὀιγεδανός*, « horrible », était un composé dont le deuxième élément était le mot *θάν(ατ)ος*, « la mort », prononcé en « macédonien » *δάνος* [62]. A sa suite, un autre étymologiste réussit à établir que l'homérique *σφεδανῶν*, « poursuivant rigoureusement », était aussi un composé dont le deuxième membre était le participe *θαν(ατ)ῶν*, « mettant à mort, tuant », prononcé en « macédonien » *δανῶν* [63].

Les linguistes modernes, au lieu de chercher à dissiper ces malentendus et à conférer aux témoignages étymologiques susdits leur véritable signification, les ont pris à la lettre et en ont dégagé, comme on l'a vu, une « caractéristique » du macédonien, qui n'a évidemment jamais existé [64].

Les deux autres assertions sont liées aux conditions politiques qui régnaient à Athènes du temps de Démosthène et d'Isocrate. Comme on le sait, Démosthène luttait pour conjurer le danger de voir Philippe de Macédoine dominer la Grèce et supprimer ses institutions démocratiques. Mais il voyait ses efforts anéantis par l'habileté et l'énergie de Philippe, les menées de ses adversaires politiques à Athènes, et l'apathie de ses compatriotes ; d'où son désespoir devant la conduite de ces derniers, sa haine contre les autres, contre Philippe en particulier, et la violence de son langage à l'égard de tous : les Athéniens, héritiers d'un glorieux passé qui leur imposait le devoir de reprendre leur hégémonie d'autrefois, se laissaient mener par des traîtres vendus à Philippe et permettaient à cet odieux « tyran » de Macédoine, un « barbare » régnant sur des « esclaves » de prétendre au rôle d'unificateur des citoyens libres [65].

Chercher à tirer de ces expressions purement démagogiques une conclusion d'ordre ethnologique, c'est oublier ou ignorer l'atmosphère

[61] Par exemple, les homériques *ξύκτας*, *ξάζω*, *ἔλδομαι*, le poétique *κεβλή*, etc. (Cf. ci-dessus, notes 19 et 20 ; KALLÉRIS, *op. cit.*, 397 ss., 419 ss., 447-450).

[62] Cf. ci-dessus, note 20 (Sur cette fiction étymologique, cf. KALLÉRIS, *op. cit.*, 143-46, 446, 449-450).

[63] Cf. Hésychius, s. v. *σφεδανῶν· φονεύων, ὀλλύς, κτείνων. τινὲς ἐωεσπευμένως. ἄλλοι δὲ σύνδετον ἐκ τοῦ σφέ καὶ δανῶν, ὅ ἐστι κτείνων.*

C'est de là qu'a été tirée la glose macédonienne fictive *δανῶν· κακοποιῶν, κτείνων* (Cf. ci-dessus, note 20 ; KALLÉRIS, l. l.).

[64] Cf. KALLÉRIS, *op. cit.*, 447 ss. Il y a eu évidemment quelques noms propres macédoniens (*Βερενίκη, Κεβαλῖνος, Ξανδικός*) ou quelques « gloses » (*ἀβροῦτες, ἄδραια* ; Cf. ci-dessus notes 19 et 20) qui ont gardé pour une raison ou pour une autre leur forme archaïque (la sonore à la place de l'aspirée régulière) ; mais ce phénomène se rencontre dans d'autres dialectes grecs, sans signifier que l'un ou l'autre de ceux-ci « employait les sonores au lieu des aspirées » (Cf. *ibid.*, 432 ss., 454 ss.).

[65] Cf. *3e Olynth.*, 16 ; *1e Philippique*, 10 ; *2e Philipp.*, 24-25 ; *3e Philipp.*, 30-31 ; *Sur l'Ambass.*, 69, 271, 308, 327, etc.

de fanatisme politique dans laquelle elles ont été prononcées et la valeur que leur attribuaient les Athéniens eux-mêmes [66].

Isocrate plaidait pour une cause différente : l'union panhellénique et la guerre nationale contre les Perses. Il travailla pour cette cause pendant un demi-siècle avec son talent d'écrivain et la foi d'un apôtre. Le plus difficile était de trouver la personne capable de réaliser un idéal si grandiose. Il pensa à Jason de Phères, à Denys de Syracuse, à Archidame de Sparte, et s'arrêta finalement (après la paix de 346) à Philippe de Macédoine. Il lui adressa une lettre ouverte, par laquelle il l'invitait à assumer cette mission patriotique. Mais une autre difficulté surgissait ici : comment faire agréer comme unificateur de la Grèce Philippe, qui était un roi grec sans doute [67], mais un roi absolu, sans éveiller les soupçons des citoyens libres des villes démocratiques ? Pour aplanir cette difficulté, Isocrate a eu recours à l'explication suivante : la dynastie de Philippe étant originaire de l'Argos du Péloponnèse (selon la légende), il imagina que son fondateur, sachant que les Grecs ne supportaient pas les monarchies, n'essaya pas de s'imposer à ses compatriotes, mais qu'il alla se tailler un royaume en Macédoine, chez « des gens étrangers », qui l'ont reçu avec plaisir parce qu'ils ne pouvaient se gouverner eux-mêmes [68].

On comprend aisément le sens moral de cette explication : Philippe, à l'exemple de son ancêtre, ne chercherait pas à étendre son pouvoir monarchique sur les Grecs libres, tandis que ceux-ci pourraient l'accepter comme *hégémon*, sans craindre qu'il n'attentât à leurs libertés civiques. Ce sont là, comme on le voit, des propos imaginaires, dépourvus de toute valeur historique et destinés à servir les desseins d'un romantisme politique [69].

Cependant c'est sur de pareils arguments qu'on a cherché à fonder, depuis un siècle déjà, cette mystification historique qu'est « la question de l'origine des Macédoniens ».

[66] Pour en avoir une idée, il suffirait de lire les discours de Démosthène et d'Eschine « Sur Ambassade » commune ; ils s'accusaient mutuellement devant le même auditoire de considérer Philippe tantôt comme l'homme le plus doué du monde et le plus pur des Grecs et tantôt comme un vaurien et le pire des barbares (Cf. Démosthène, 1. c., 305-8 ; Eschine, 1. c., 41, 109-12, 164). Cf. aussi la note suivante.

[67] Depuis Hérodote (Cf. plus haut, notes 11 et 59), personne en Grèce ne doutait de l'origine grecque de la dynastie macédonienne ; d'ailleurs, s'il en était autrement, Isocrate n'oserait pas proposer Philippe comme candidat à l'hégémonie sur les Grecs. Mais chercher à tirer de cette légende une conclusion historique sur la différence de race entre les rois et le peuple macédoniens (comme l'ont fait certains savants modernes qui ont cru en trouver la confirmation dans THUCYDIDE, II, 80), c'est méconnaître précisément la réalité historique (Cf. KALLÉRIS, *op. cit.*, chap. IV, § 6).

[68] Philippos, 106-8.

[69] Du reste, Isocrate lui-même dans ce même discours (§ 154) et ailleurs (3e lettre à Philippe, 5) distingue nettement les Macédoniens des barbares (Cf. KALLÉRIS, 1. 1., § 7).

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EL HECHO LINGÜISTICO VASCO *

El hecho lingüístico vasco no ha dejado de atraer la atención de círculos eruditos próximos y lejanos, al menos a partir del Renacimiento. El humanista Lucio Marineo Sículo incluyó un breve vocabulario vasco en su *Opus de rebus Hispaniae mirabilibus* (1533) donde sostiene la opinión de que el vascuence es la lengua primitiva de la Península, anterior incluso a la llegada de los iberos, y Rabelais dió entrada en su *Pantagruel* a un breve texto vasco de discutida interpretación. Pero las razones de ese interés no han sido siempre las mismas.

Sorprende en primer lugar que una población reducida, comprendida dentro de los límites del Imperio Romano, haya podido conservar su lengua cuando tantos pueblos más numerosos y de mayor desarrollo cultural la perdieron. Volvemos más adelante sobre las posibles causas de este hecho. Señalaremos por el momento, a falta de estadísticas precisas, que el príncipe Luis Luciano Bonaparte evaluaba en 800 000 el número de personas de habla vasca en 1873 (660 000 en España y 140 000 en Francia), cifra que G. Lacombe reduce a 700 000 hacia 1940 [1]. A pesar del retroceso conocido del vascuence en Alava y Navarra en los siglos XVIII y XIX, no es probable que el número de vasco-hablantes fuera muy superior en los siglos inmediatamente anteriores. Téngase en cuenta además que, aunque el bilingüismo no alcanzó probablemente nunca — ni siquiera acaso en algún momento de la época romana — la misma extensión que en nuestros días, ha debido ser siempre factor importante, aunque variable, de la situación lingüística. Sería por otra parte equivocado suponer, con toda probabilidad, que no hubo un número crecido de bilingües antes del comienzo de la influencia latina.

Pero la rareza de la conservación de la lengua vasca no ha sido sin duda lo que ha atraído principalmente la atención de quienes se han interesado por conocerla. Su mayor antigüedad *in situ* se interpretó, y no

* Recomendado por el Profesor J. Pérez Villanueva y Profesor L. Pareti.

[1] *Les Langues du Monde*², Paris, 1952, p. 259 ss.

es raro que hoy todavía se interprete, como mayor antigüedad en general : el vascuence sería así una lengua más antigua, más primitiva, más próxima a los orígenes del hombre que, por ejemplo, las lenguas indoeuropeas. No hay necesidad de insistir en lo que hay de ilusorio en este punto de vista. Hay que decir, sin embargo, que, aún erróneamente expresado, hay en él algo válido. En efecto, la lengua vasca ha sido profúndamente influída por el latín y sus formas modernas por lo menos : una parte importante de su vocabulario es de ese origen, sus sonidos y en muchos aspectos sus sintaxis han sido profúndamente alterados hasta el punto de que muchas veces sorprende su semejanza con las lenguas vecinas. Pero su estructura gramatical en conjunto parece haberse mantenido fiel al tipo antiguo. La lengua vasca no representa, pues, nada particularmente original o primitivo en realción con las lenguas vecinas, pero sí algo distinto en la medida que lo permite la identidad fundamental de la naturaleza humana y de los medios humanos de expresión.

Gracias a la conservación del vasco, poseemos, aunque en forma moderna y modificada, una muestra de las lenguas habladas en el Occidente europeo con anterioridad a la difusión de las indoeuropeas, y la poseemos no en restos fragmentarios, sino como totalidad estructurada Y de aquí su interés para la tipología de las lenguas.

Tampoco hemos llegado con ésto a la raiz más profunda de la fuerza de atracción del vascuence. El siglo pasado conoció el nacimiento y los grandes triunfos de la lingüística comparada. La lingüística comparada parte, como es bien sabido, del supuesto de que ciertas coincidencias — basadas no en el simple parecido, sino en correspondencias regulares de sonidos — en el vocabulario básico y en los morfemas gramaticales entre dos o más lenguas se explican por un origen común. Dicho de otra manera, esas lenguas representan formas distintas que ha tomado una misma lengua al evolucionar en el tiempo y en el espacio. La lingüística del siglo pasado puso además a punto métodos para reconstruir hasta cierto punto esas « protolenguas » no atestiguadas diréctamente.

La actitud crítica de nuestro siglo ante las ideas del precedente está muchas veces bien fundada. Es a todas luces abusivo, en primer lugar, que en la práctica se sigua entendiendo por comparación lo que R. Jakobson llama « la exploración de las semejanzas heredadas de un estado prehistórico común », con exclusión de tantas otras posibilidades. Las semejanzas adquiridas, en particular, son tan dignas de atención como las heredadas. Por otra parte, la diferencia entre el parentesco original y la afinidad no es acaso en el fondo másque una cuestión de grado.

Y, sin embargo, cualesquiera que sean sus reparos teóricos, vemos que los lingüistas de nuestro siglo reinciden una y otra vez en el viejo comparatismo. Sin salirnos de nuestro terreno, H. Schuchardt, el gran enemigo del comparatismo simplista, nos proporciona una prueba resonante. Porque, como veremos, el intento de Schuchardt de relacionar el vasco

con las lenguas hamito-semíticas se diferenciaba muy poco en el fondo de la tentativa de cualquier comparatista de relacionar genealógicamente unas lenguas con otras, y la principal razón de su falta de éxito fué probablemente que quiso hacer comparatismo sin respetar las reglas que son las únicas que hacen de él algo más que un mero pasatiempo.

La lingüística comparada clásica posee unos métodos cuya eficiencia ha quedado sobradamente probada. Han podido ser afinados en años recientes, pero en el fondo siguen siendo los mismos. Es más, todo lo que después se ha hecho de útil para poner a punto nuevas técnicas en lingüística diacrónica no aspira a sustituir las antiguas, sino que la supone como base y parte de ellas.

Es esencial para nuestro objeto señalar que los resultados positivos obtenidos por la comparación deben ordenarse por necesidad en una perspectiva histórica. Si se demuestra que dos lenguas habladas en áreas no contiguas están emparentadas entre sí, el hecho habrá de ser explicado históricamente : o se tratará de una migración de uno o de ambos grupos, o bien un área lingüística originariamente contínua se habrá fragmentado a consecuencia de movimientos de pueblos de habla no emparentada o al menos porque éstos hayan conseguido imponer su lengua a los vecinos. Generalmente no suelen faltar medios para decidir con alguna probabilidad entre las distintas alternativas.

Ahora bien, la lengua vasca es, según la opinión más común, una lengua aislada, no relacionada genéticamente con ninguna de las demás lenguas conocidas. Si consideramos la totalidad de las lenguas del mundo, aun limitándonos a las vivas, tal situación está lejos de ser excepcional. Pero no así en Europa. Por más que las relaciones entre pueblo y lengua sean bastante laxas, demostrar que el vasco esta emparentado con otra u otras lenguas parece que equivale a aclarar hasta cierto punto, si no el origen de los vascos, sí al menos la procedencia del elemento cultural más característico de ese pueblo. Y ésto es lo que se quiere decir cuando se habla del « enigma vasco ». En la formación del pueblo vasco o en la evolución de la lengua vasca hay infinitos puntos obscuros, como también los hay en la historia de otros pueblos y otras lenguas, incluso en aquellos que son mejor conocidos. Este interés por los orígenes podrá ser desmedido, y hasta irracional, ya que el origen último de cualquier cosa parece estar oculto al conocimiento científico, pero como factor de la conducta humana es hoy tan actual como en el siglo pasado, y difícilmente podrá nunca desaparecer del todo.

Los estudios relativos a la lengua vasca han seguido en general la marcha progresiva que es normal en cualquier disciplina científica. La masa de materiales a la disposición de los investigadores ha ido creciendo y también se ha avanzado en su elaboración. Se sabe hoy sin duda más que hace por ejemplo cien años sobre las distintas variedades del vasco en el tiempo y en el espacio. Se comprende mejor su estructura, etc. Pero

los resultados de esta labor paciente y continuada difícilmente pueden llegar al conocimiento de un público extenso. La cuestión de las posibles relaciones del vasco con otras lenguas antiguas y modernas no ha dejado, por el contrario, de interesar fuera del reducido círculo de especialistas.

Según la tesis tradicional de los eruditos vascos, mantenida sin interrupción más o menos hasta finales del siglo pasado, el vascuence es la lengua primitiva de España y fué en un tiempo la única que se hablaba en toda la Península. La tesis tuvo contradictores, pero no es éste el momento para hacer la historia de la polémica [2], cuyos motivos no fueron exclusivamente científicos. Bastará con decir que sus dos postulados esenciales han resultado erróneos. En la época más antigua a que alcanzan nuestros datos se hablaba ya más de una lengua en la Península, y el vascuence está muy lejos de haberse mantenido inmutable en su ser original. Sus contradictores tenían además razón al señalar en el léxico vasco abundantes elementos que éste ha ido tomando de las lenguas vecinas a través de su historia. Alguno de ellos parece, sin embargo, haber tenido una curiosa idea de lo que son las lenguas, al pensar que una de ellas se forma por la mezcla de varias otras, como el aire resulta de la mezcla de varios gases.

La tesis que se suele llamar vasco-iberista alcanzó resonancia europea gracias a la obra de Guillermo de Humboldt. Su principal iniciador en el conocimiento de la lengua vasca fué P.P. de Astarloa, pensador tan desenfrenado como agudo, y sus ideas sobre la extensión antigua de la lengua vasca no eran originales. Como ha señalado Caro Baroja, la hipótesis de que la lengua de los iberos, el vasco, se hablaba no sólo en toda la Península, sino también en el sur de Francia y en Italia con sus tres islas, fué ya expresada con toda claridad por el conocido precursor de la lingüística comparada, Lorenzo Hervás y Panduro. También lo fué por el vizcaíno J. A. Moguel [3], y el método de demostración fué también fundamentalmente el mismo. Como todavía se había avanzado muy poco en la lectura de las inscripciones en alfabeto indígena, el material se componía sobre todo de los nombres de lugar transmitidos por los autores clásicos que se trataban de explicar por medio de la lengua vasca. Naturalmente, como su experiencia en esta materia era más corta que la nuestra — no hay en realidad nombre de lugar de cualquier parte que se resista a ser interpretado por medio de cualquier lengua a condición de que se emplee el empeño y el ingenio adecuado —, los resultados obtenidos gozaron de un crédito que no pueden tener en nuestros días.

[2] Puede verse por ejemplo en J. Caro Baroja, « Observaciones sobre la hipótesis del vascoiberismo considerada desde el punto de vista histórico », *Emerita*, 10 (1942), p. 236 ss. y 11 (1943), p. 1 ss.

[3] *La Historia y Geografía de España ilustradas por el Idioma Vascuence*, Bermeo, 1935, editado por el Dr. J. Garate. El ms. se encuentra en Berlín, pero segúramente Humboldt no llegó a conocerlo cuando publicó su *Prüfung* en 1821.

Pero la tentativa más importante para demostrar la íntima conexión entre vasco e ibérico fué sin duda la realizada a principios de este siglo por H. Schuchardt [4]. Tenía a su disposición nuevos materiales : los textos en escritura indígena reunidos algunos años antes por E. Hübner [5]. El sistema de lectura de éste, que Schuchardt siguió, era evidentemente imperfecto — faltaban vocales y sobraban consonantes —, pero podía considerarse al menos como una aproximación. Además, Schuchardt basó su intento en la comparación de los sufijos de declinación ibéricos y vascos, como elementos más permanentes y más típicos que el léxico.

La demostración de Schuchardt fué aceptada como definitiva durante años en los círculos lingüísticos y aún hoy puede vérsela citada como tal en trabajos no especializados. Todavía en 1942 el lingüista C. C. Uhlenbeck, buen conocedor del vasco, decía extrañado : « ¿ Es que las reconstrucciones de Schuchardt, tan plausibles en sí, no serán más que un espejismo vano ?. Nos cuesta mucho creerlo. » [6] Y, sin embargo, pocas dudas se pueden abrigar hoy a este respecto. El caso es tan aleccionador que vale la pena de que examinemos con brevedad las causas de su fracaso.

Schuchardt estaba excepcionalmente dotado para la tarea. De espíritu sagaz e independiente hasta la genialidad, tenía amplísima experiencia lingüística y fué uno de los mejores conocedores del vasco de todos los tiempos. A pesar de la ruina de su tesis fundamental, su *Iberische Deklination* sigue siendo obra de la mayor importancia por la riqueza de detalles tratados con la mayor penetración.

La razón principal del descrédito en que después ha caído su demostración habrá que buscarla en primer lugar en que se basó en el sistema de lectura de Hübner notoriamente insatisfactorio, sin tratar de mejorarlo. Dejó de lado el problema, al parecer como secundario. Mientras la lectura fuera deficiente era comprensible que no se pudieran explicar por el vasco las inscripciones en escritura indígena de alguna extensión.

Cuando apareció el plomo de Alcoy, bastante extenso, y se vió que M. Gómez-Moreno tenía razón al pensar que estaba escrito en un alfabeto griego, es decir en una escritura perfectamente inteligible, la demostración de Schuchardt recibió ya el golpe de muerte. Ese tecto podía leerse, pero no interpretarse — al menos nadie lo ha conseguido hasta ahora — por medio del vascuence. No es que quedaran lagunas en la traducción : es que todavía hoy lo único que sabemos acerca del contenido de ese tecto es lo que se puede inferir de la materia en que está grabado.

Esto ha quedado confirmado al descubrir Gómez-Moreno el valor real de la gran mayoría de los signos ibéricos. Se ha visto también que

[4] *Die Iberische Deklination*, Wien, 1907.
[5] *Monumenta Linguae Ibericae*, edidit Aem. Hübner, Berolini, 1893.
[6] « Les couches anciennes du vocabulaire basque », traducción del original holandés *Eusko-Jakintza*, 1 (1947), p. 550.

el material utilizado por Schuchardt no era homogéneo, pues la lengua de una parte importante de las inscripciones es claramente indoeuropea [7]. Aun dejando a un lado estas inscripciones, las celtibéricas y las del sur, que no se han acertado a leer bien todavía, el resto, el conjunto de textos que ahora llamamos ibéricos en sentido propio, que pueden estar escritos en una misma lengua, siguen siendo refractarios a una traducción por medio del vasco.

Esta imposibilidad real de interpretación hace muy difícil sostener que el ibérico sea una forma antigua del vasco o que al menos esté estrechamente emparentado con él.

A pesar de ello, parecen descubrirse algunas semejanzas. El sistema de los sonidos ibéricos, en la medida en que podemos inferirlos a través de la escritura, presenta curiosas analogías con el de los que creemos existían en el vasco antiguo, aunque no hay que olvidar que también hay un parecido notable en época moderna entre los sonidos castellanos y vascos. Algunos elementos ibéricos parecen por otra parte ser idénticos a otros vascos, en cuanto a la forma naturalmente. Resulta curioso constatar que esas coincidencias parecen más frecuentes en nombres propios de lugar o de personas : *Iliberris*, vasc. *Iriberri* « Villanueva » ; ib. *bios(ildun)*, aquitano *Bihoxus*, vasc. *bi(h)otz* « corazón », etc. Si esta impresión se confirmara, sería difícil pensar que el vasco hubiera tomado esos elementos del ibérico, a pesar de que lo sabemos de ambas culturas hace pensar que los préstamos tuvieron que seguir normalmente esa dirección. Acaso la presumible uniformidad del ibérico, lengua escrita de un territorio bastante extenso, recubra y oculte la diversidad lingüística real.

Schuchardt extendió la comparación a las lenguas hamito-semíticas y al nubio. Probablemente hoy no se puede dar la importancia que él daba al ibérico como eslabón entre los Pirineos y el norte de Africa. El pueblo portador de la cultura ibérica pudo proceder de Africa, pero, aun cuando ello estuviera perfectamente demostrado por razones de otro orden, no se seguiría de ahí que el ibérico estuviera relacionado genealógicamente con las lenguas africanas. Sólo hay un medio de probar el parentesco de las lenguas : debe ser demostrado por procedimientos lingüísticos, independientemente de toda otra consideración. Y en el estado en que se encuentra actualmente la interpretación de los textos ibéricos, cuando apenas acertamos a distinguir en los textos los nombres propios, no parece haber fundamentos para sostener una tesis sobre las posibles relaciones de parentesco de esa lengua [8].

Aun prescindiendo del ibérico, el crédito de que gozó el ensayo

[7] El mejor estudio de conjunto es el de A. Tovar, *Estudios sobre las primitivas lenguas hispánicas*, Buenos Aires, 1949.

[8] Véase, no obstante, Tovar, *Estudios*, p. 61 ss. y p. 90 ss.

comparativo de Schuchardt fué efímero. El método comparativo está basado en la noción de probabilidad, aunque sus resultados no sean exactamente cuantificables. Ciertas coincidencias, en forma y sentido, entre elementos gramaticales o voces pertenecientes a la parte más estable del léxico de dos o más lenguas se explican por diversificación a partir de la lengua común. Pero la coincidencia no es el simple parecido — el comparatista desconfía siempre de un parecido demasiado grande — sino, por lo que respecta a la forma, la correspondencia precisa entre los sonidos de las distintas lenguas. Schurchardt no intentó siquiera establecerlas. Sostenía que, aun sin correspondencias, el comparatista experto sabe, por instinto y experiencia, cuándo el número de coincidencias es suficiente para excluir la mera casualidad. Pero un criterio subjetivo sólo tiene valor subjetivo y por lo visto el instinto y la experiencia de otros comparatistas no estaba de acuerdo con los suyos. Es difícil, en efecto, que, si podemos comparar una palabra vasca con palabras del crecido número de lenguas que Schuchardt incluía dentro del grupo hamito-semítico, no se encuentre alguna en una de éstas que se parezca en los sonidos y no esté demasiado distante por el sentido.

La comparación del vasco con las lenguas caucásicas ha sido llevada a cabo más extensa y sistemáticamente. Ya Schuchardt no se oponía a la idea de que el vasco estuviera emparentado con ese grupo de lenguas, sino que se limitaba a afirmar que el parentesco era menos estrecho que con las hamito-semítica. Defendido por Trombetti dentro de su tesis general y más precísamente por C. C. Uhlenbeck y G. Dumézil, ha encontrado sus mejores sostenedores en los profesores K. Bouda y R. Lafon. El número de aproximaciones propuestas, tanto de elementos morfológicos como léxicos, es sumamente crecido, y la actitud de la crítica ha sido en conjunto favorable.

Sin embargo al juzgar hoy los resultados seguros obtenidos en esta meritoria labor de exploración, no resultan tan concluyentes como la masa impresionante de materiales presentados podría hacer pensar. El profano, y no raras veces también el especialista, tienden a olvidar que el término « grupo lingüístico » está lejos de ser usado unívocamente. En ciertos casos favorables, entre los cuales se encuentra el grupo familiar para nosotros de las lenguas indoeuropeas, se trata efectívamente de lenguas cuyo parentesco ha sido establecido de una manera precisa y concluyente, aunque sus relaciones mútuas no estén ni mucho menos fijadas con toda exactitud por llamarlas emparentadas ; en otros, se trata de lenguas que muchos o algunos investigadores creen emparentadas, sin que puedan demostrar su opinión de una manera concluyente, como en el caso anterior ; en algunos, finalmente, el grupo consiste simplemente en algunas lenguas que son vecinas entre sí. Y sólo una cierta práctica puede enseñar que el valor probativo de los paralelos presentados está sujeto a variar dentro de límites amplísimos.

Otra vez nos encontramos con que los términos de comparación son muy poco homogéneos. No se comparan entre sí un vasco y un caucásico común únicos, reconstruídos por comparación, sino formas modernas de dialectos vascos o lenguas caucásicas, tomados muchas veces individualmente. El trabajo comparativo previo ne está demasiado avanzado en el terreno vasco, a pesar de la proximidad evidente de las distintas variedades ; en el Cáucaso queda mucho más por hacer. El parentesco de las lenguas caucásicas del sur parece estar fuera de duda, pero habría mucho que decir sobre las relaciones mútuas de los distintos grupos de lenguas del norte. Pero, aun suponiendo que sea indudable el parentesco de estas últimas, la relación entre las lenguas del norte y las del sur es hoy todavía materia de opinión o de creencia, no de conocimiento.

Volvemos otra vez al mismo defecto. Como consecuencia del crecido número de las lenguas caucásicas de filiación no establecida y de la laxitud de las correspondencias fonéticas propuestas sobre todo, la parte atribuible al azar en las coincidencias presentadas como prueba es tan grande, que el valor de éstas se debilita hasta el punto de que la decisión ante la tesis vasco-caucásica se convierte en materia de fe, y no de demostración. En un artículo reciente, aparecido en el *Bulletin de la Société de Linguistique de Paris* [9], H. Vogt ha razonado solídamente los fundamentos de su es cepticismo, y estas palabras resumen bien su opinión : « L'hypothèse euskaro-caucasique reste une possibilité, nous doutons qu'il soit possible de la prouver, et nous pensons que l'énergie dépensée dans cette recherche est hors de proportion avec les résultats qu'on peut espérer obtenir ».

El deseo de saber no se resigna a los límites y es fácil que estas mismas u otras hipótesis sigan siendo sostenidas en el futuro. Convendría por tanto, allanar el camino y apartar en lo posible las ocasiones de errar. También en lingüística diacrónica no es a menudo lo que parece y lo que no parece es, y el azar tiene una capacidad combinatoria muy superior a la de cualquier cerebro humano. El vasco posee alguna diversidad dialectal y su historia no estan breve como suele decirse ; la literatura vasca empieza en el siglo XVI, aunque algunas composiciones poéticas sean sin duda de fecha anterior, y su volumen no es muy grande. Y, sin embargo, ningún lingüista ha podido alcanzar probablemente hasta ahora un conocimiento suficiente de las variedades y de los textos. Falta la labor previa de ordenación y sistematización que lo haría posible.

Sería erróneo, por otra parte, creer que antes de 1500 no hay nada o casi nada. Hay mucho más que algunas palabras y unas breves frases. Hay por lo menos, sobre todo para Alava, Navarra y La Rioja, miles de nombres vascos de lugar y muchos nombres de persona a partir del siglo IX, que proporcionan datos de primera importancia en particular

[9] 51 (1955), p. 121 ss.

para la historia de los sonidos vascos. Esta labor, que ya fué iniciada con certero criterio en el siglo pasado por el historiador francés A. Luchaire, debe ser proseguida. Puede proseguirse con independencia de cualquier ensayo comparativo de largo alcance, pero todo intento comparativo deberá tener en cuenta sus resultados y basarse en ellos.

El léxico vasco, como el de cualquier otra lengua, está compuesto de elementos de muy diverso origen, incorporados a la lengua en fechas muy distintas. El comparatista que intenta emparentar el vasco con otras lenguas sólo podrá tener en cuenta evidéntemente aquellos componentes que ofrezcan garantías de antigüedad. Esto significa que, previamente, los elementos de entrada más reciente deben ser identificados en lo posible para prescindir de ellos en la comparación.

Aquí entra en cuenta en primer lugar la enorme masa de elementos procedentes del latín o de las lenguas romances. Parece que su identificación no debiera ofrecer grandes dudas, pero no es así. Aun prescindiendo de la determinación precisa del origen, el lingüista más de una vez no puede terminar de decidirse acerca de si una palabra o un sufijo es o no de origen románico. El vasco, como se ha señalado repetidas veces, tiene una suerte de talento especial para enmascarar e incorporarse los bienes de cualquier procedencia. Sobre todo, las cuestiones no se han estudiado con el detalle debido. Es Schuchardt quien más ha trabajado en este terreno, dada su doble y eminente capacidad de romanista y vascólogo, pero su labor muestra las mismas cualidades que la mayor parte de su obra : brillantez e impresionismo. Entre sus etimologías románicas no son pocas las que están en clara contradicción con la historia de las palabras — algunas fueron abandonadas por él mismo —, y algunas no pueden ser admitidas si se presta la más mínima atención a los sonidos.

En este aspecto particular habría todavía trabajo para una nutrida generación de investigadores expertos. Más arriba de los comienzos de la influencia latina nos movemos en terreno mucho más inseguro. Tenemos motivos fundados para pensar que pueblos de habla indoeuropea fueron en la antigüedad vecinos de los vascos y que incluso estuvieron establecidos en medio de éstos. Sin embargo, los elementos de procedencia indoeuropea segura que se han podido señalar hasta ahora en el léxico vasco, aunque indudables, no parecen guardar proporción con la influencia que creemos debieron ejercer las poblaciones de habla indoeuropea : acaso muchas voces tomadas de éstas, por pertenecer a las zonas más variables del vocabulario, fueron sustituídas en el curso del tiempo por otras de origen latino. No siempre es fácil, además, adscribir estos elementos a una lengua determinada y sería aventurado sustituir indoeuropeo por celta. En la toponimia de Vasconia se descubren, sí, grupos de nombres que parecen refractarios a una explicación vasca, pero en muy pocos casos, como el de *Deva*, se ha demostrado que sean

precísamente de origen indoeuropeo. Se puede sospechar una influencia de esas lenguas sobre la vasca en otros aspectos — la composición, la abundancia de los sufijos de derivación, etc. —, pero difícilmente se encontrará hoy por hoy la manera de demostrarlo adecuadamente.

Más de una vez voces de origen indoeuropeo no latino — la mayoría quizá célticas — aparecen no sólo en vasco, sino también en lenguas romances. En esos casos es muy difícil, por no decir imposible, averiguar si el vasco las ha tomado directamente o si los transmisores han sido el latín y sus continuadores. Esto es también lo que ocurre con palabras de procedencia indeterminada, extrañas al latín clásico, que se presentan tanto en vasco como en uno o varios romances. Aquí toda conclusión — al menos tratándose de palabras aisladas — es por necesidad insegura, ya que no puede operarse con sistemas, sino con fragmentos desarticulados. Sin embargo consideraciones de forma y de extensión espacial y la gran riqueza de materiales reunidos por la dialectología moderna han hecho posible que investigadores decididos a afrontar los riesgos, como V. Bertoldi, M. L. Wagner y J. Hubschmid, hayan realizado y realicen una muy importante labor cuyos resultados deben ser tenidos muy en cuenta.

Remontándonos más en el tiempo, no hay hoy por hoy nada más que separar. No ocurre así sin duda porque el vasco anterior fuera perfectamente homogéneo y sin incrustaciones extrañas, sino porque nuestros conocimientos están radicalmente limitados. El único camino, por estrecho que sea, que queda abierto es el de la reconstructión interna. Sus resultados serán por necesidad fragmentarios y sólo probables, con mayor o menor probabilidad ; no podrán por otra parte ser fechados con exactitud. Pero no deja con todo de ser un camino cuyas posibilidades están lejos de haber sido totalmente exploradas.

* * *

El primer testimonio claro que poseemos sobre la difusión de la lengua vasca o mejor de los dialectos eúskaros nos lo proporcionan las inscripciones aquitanas de época romana. Aparecen en ellas, no sólo en la zona montañosa desde el valle de Arán hacia el Oeste, sino también en el país de los Ausci, nombres de personas y de divinidades de carácter inconfundible. Aunque hoy no podemos estar de acuerdo con todos los detalles de la demostración de A. Luchaire [10], sus conclusiones generales siguen siendo irrebatibles. Nombres de mujer aquitanos como *Andere* o *Nescato*, de hombre como *Cison* o los que tienen como primer elemento *Sembe*, son estrictamente comparables a vasc. *and(e)re* « señora, mujer », *neskato* « muchacha » (derivado de *neska* « id. » con el sufijo *-to* frecuente en palabras vascas), *gizon* « hombre », *seme* « hijo ». Claro es que no todo

[10] *Les origines linguistiques de l'Aquitaine*, Pau, 1877 ; *Études sur les idiomes pyrénéens de la région française*, Paris, 1879.

se explica tan fácilmente en la onomástica aquitana. En algunos casos puede tratarse de palabras que el vasco, conocido en fecha muy posterior, ha perdido ; en otros, de nombres de origen distinto. Entre éstos podemos reconocer con seguridad nombres de fisonomía claramente gala.

Como los nombres pueden conservarse después de haberse dejado de usar la lengua de que proceden, podemos por lo menos afirmar que en una parte de la Aquitania se hablaron en época inmediatamente anterior dialectos estréchamente emparentados con el vasco. Es natural suponer que retrocedieron ante el latín e incluso podemos suponer que anteriormente perdieron terreno ante el galo. Pero nuestras presunciones sobre la extensión del aquitano en épocas más remotas habrán de quedar por ahora en meras conjeturas.

No deja de parecer sorprendente que los testimonios de orden lingüístico sean menos concluyentes para el lado español de los Pirineos. En el territorio que después aparece designado como País Vasco hay algún nombre de lugar, documentado ya en época romana, que puede interpretarse por el vasco, como también algún otro situado fuera de él. En los nombres de persona contenidos en el bronce de Asceli, del año 90 a. C., no parece haber diferencias importantes entre los de los vascones y los de los demás, que parecen ser originarios de la zona comprendida entre el Ebro y los Pirineos. Es decir que, al menos los más característicos, tienen un común aspecto ibérico, aspecto que también se encuentra en la onomástica hispana de zonas muy alejadas de la que estamos considerando. Ya hemos señalado que al menos alguno de sus componentes son de tipo vascoide, lo que acaso podría interpretarse como indicio de una mayor difusión en tiempos anteriores de hablas del grupo eúskaro por nuestra Península. Pero en todo caso su relación con el vasco histórico es mucho menos clara : los ejemplos son mucho menos abundantes y concluyentes que en la onomástica aquitana.

De cualquier modo, existe un acuerdo sobre los límites aproximados de la zona en que se hablaban dialectos eúskaros hacia los comienzos de la dominación romana. Al sur de los Pirineos, se encuentra toponimia de cáracter vasco, en algunos casos indiscutible, muy al este de la zona moderna de habla vasca. Por el contrario, hacia el oeste ésta cesa de una manera abrupta dentro mismo de Vizcaya. Por más que hechos medievales hayan podido influir, es difícil admitir que la raiz de esta situación no sea más antigua. Según toda probabilidad, las gentes de habla vasca limitaban con pueblos de lengua indoeuropea no muy lejos de Bilbao. Al oriente, se hablarían dialectos eúskaros por lo menos en los valles pirenaicos de ambas vertientes, en la meridional hasta dentro de Cataluña [11].

[11] Coincide en buena parte con este territorio el área de los topónimos en *—ós, —ués* estudiados por G. Rohlfs, « Sur une couche préromane dans la toponymie de Gascogne et de l'Espagne du Nord », *Revista de Filología Española*, 36, p. 209 ss.

Si estos límites son imprecisos, parecía que al menos debiera haber un acuerdo general sobre los pueblos que los geógrafos clásicos sitúan en la moderna Vasconia : vascones, várdulos y caristios principalmente. No es así. Desde hace algún tiempo no han faltado intentos de separar « vascos » de navarros, aunque para ello fuera necesario suponer que son estos últimos los únicos vascos verdaderos. Así en la teoría de A. Schulten, quien suponía, no sin violentar la interpretación de los textos clásicos aducidos como prueba, que la vasquización de las llamadas Provincias Vascongadas era el resultado de un corrimiento hacia el occidente de los vascones ya en época romana. Esto está lejos de haberse demostrado. Es cierto, por el contrario, que los romanos adscribieron a distintos conventos jurídicos a los vascones de una parte y a los várdulos y caristios de otra. Pero las divisiones político-administrativas no siempre coinciden con los límites lingüísticos. Es dudoso, por otra parte, que la totalidad de los vascones fueran de una misma lengua a la llegada de los romanos. La parte meridional de Navarra, como la de Alava, debió estar ya anteriormente sometida a fuertes influencias culturales y probablemente lingüísticas de parte de sus vecinos. El mismo nombre de los vascones es acaso indoeuropeo y con seguridad las leyendas de algunas monedas acuñadas en su país son nominativos indoeuropeos de plural [12].

Según el prof. J. Maluquer de Motes [13], hay tres momentos decisivos en la formación del pueblo vasco, que se puede seguir ininterrumpídamente a partir del período aziliense : la transformación neolítica, las invasiones indoeuropeas y el contacto con Roma. Pueblo y lengua no son inseparables, pero en nuestro caso no hay razón para no suponer, mientras falten pruebas en contrario, que ésta es tan antigua *in situ* como aquél.

Los comienzos del neolítico están demasiado lejanos. Ya hemos visto que las invasiones indoeuropeas no han tenido el reflejo lingüístico que acaso cabía esperar, pero ésto no puede invalidar las pruebas de otra índole [14]. Del choque con el latín y la cultura latina podemos ya formarnos una idea aproximada.

El vascuence, por rara excepción, sobrevivió al Imperio Romano, aunque sería ingénuo creer que no fué afectado por el contacto. Todavía muestra muy claras huellas de él, sobre todo en un crecido número de palabras, tomadas indudablemente en fecha muy antigua. J. Caro Baroja

[12] Tovar, *Estudios*.

[13] « Contribución de la Arqueología al conocimiento de la formación del pueblo vasco », *Zumárraga*, 4 (1955), p. 57 ss., cuyas ideas hemos aprovechado repetídamente en lo que sigue.

[14] Así ocurre también con las huellas comprobables del etrusco sobre el latín, a pesar de la evidente importancia de la influencia etrusca en momentos decisivos para la formación del pueblo romano. Cf. L. R. Palmer, *The Latin Language*, London, s. a., p. 46 s.

sobre todo ha demostrado [15] que la toponimia de origen latino es mucho más abundante en extensas zonas de Vasconia de lo que se había pensado. Y, aunque no se puede asegurar que todos esos nombres, sobre todo de población, sean de fecha romana — hay motivos, por el contrario, para pensar que por lo menos uno de los tipos de formación seguía vivo siglos después —, allí donde la densidad de los topónimos latinos coincide con la abundancia de los hallazgos arqueológicos el latín sustituyó con seguridad a la lengua anterior.

Lo que salvó en primer lugar al vascuence de la desaparición fué segúramente la descomposición del imperio romano. Como en una carrera contra reloj, la lengua indígena perdió posiciones, vió reducida su extensión, llegó posíblemente a estar en inminente peligro de extinguirse, pero sobrevivió a su adversario. Ya a mediados del siglo III, con las invasiones y la desorganización política, fué disminuyen do la influencia romana, que ya en el siguiente puede considerarse nula para algunas zonas. « Algunos de los pueblos... — escribe Caro Baroja [16] — que, al parecer, se habían mantenido tranquilos durante muchos años, pero sin perder sus especiales características, comienzan a sentirse con fuerza suficiente para volver a sus costumbres y despreciar la autoridad imperial ».

Si el rápido debilitamiento del poder romano fué decisivo al final, no dejaron tampoco probablemente de tener importancia sus principios. No parece que los romanos encontraron mayor resistencia entre los pueblos de habla vasca. Antes bien éstos debieron ver en aquéllos un alíado contra la expansión celtibérica, y el poder celtibérico era el mayor obstáculo para la expansión romana.

Una razón de orden distinto es la que he oído exponer a A. Tovar. El vasco pudo conservarse mientras otras lenguas hispánicas y el galo se perdieron precísamente porque su estructura era tan distinta de la del latín. Se pensaría, en efecto, que cuanto más próximas entre si son dos lenguas, tanto más fácil será que una de ellas desaparezca como disolviéndose casi imperceptiblemente en la dominante. Tratándose de idiomas muy distintos, por el contrario, el cambio de lengua no puede hacerse sin saltos bruscos : es más difícil que las gentes adquieran la segunda lengua, y luego, hasta cuando abandonan la antigua para usar exclusivamente la nueva, la elección se hace entre dos sistemas de expresión perféctamente distintos entre sí.

Ninguna de las dos últimas consideraciones bastan para explicar la totalidad de los hechos, y sólo han sido presentadas como explicaciones parciales. La mayor o menor semejanza con el latín podría dar razón de

[15] *Materiales para una historia de la lengua vasca en su relación con la latina*, Salamanca, 1945. Entre las págs. 36 y 37 hay un mapa del País Vasco donde está señalado el emplazamiento de las poblaciones antiguas y se indican los hallazgos arqueológicos.

[16] *Los pueblos del Norte de la Península Ibérica*, Madrid, 1943, p. 99.

que se haya conservado el vascuence cuando la lengua de cántabros o celtíberos se perdió, pero también se ha extinguido el ibérico que no debía ser más parecido al latín que el vasco. Por otra parte, si los romanos no trataban de imponer su idioma por medios violentos, no por ello era el latín enemigo menos terrible, lo mismo para los alíados que para los enemigos sometidos. No sólo era la lengua de la cultura, de la administración y del ejército — y no fueron escasas las gentes de habla vasca que sirvieron en éste —, sino que, aparte de toda consideración de tipo práctico, debía presentarse cargada de tal prestigio a los ojos de los pueblos dominados que ese atractivo era poco menos que irresistible. Su simple proximidad constituía para otras lenguas una amenaza mortal.

El espacio, y no sólo el tiempo, jugó en favor de la lengua vasca. La romanización, como una marea, avanzaba de este a oeste, paralelamente a los Pirineos, y además en direcciones opuestas hacia el mismo punto : de norte a sur en Francia y de sur a norte en España. El único espacio que con seguridad no llegó completamente a cubrir fué el territorio situado en el rincón del golfo de Vizcaya, alejado por igual de los centros de que partía el impulso romanizador al norte y al sur. Dentro de Vasconia no hubo ciudades importantes : Pamplona, la Iruña vasca, no tuvo el poder de irradiación de Huesca y lo mismo puede decirse de la Iruña alavesa o con mayor razón de Lapurdum al norte. Y la importancia de los núcleos urbanos como focos de romanización debió disminuir grandemente a partir del siglo III con el proceso general de ruralización.

La principal defensa estuvo no en la fuerza, sino en la misma debilidad e insignificancia del país y de las gentes. El retraso cultural, en contraste con lo que ocurrió en las zonas más progresivas del sur y levante, hizo mucho menos seductora la tentación del latín. La pobreza del territorio disminuyó el interés del Imperio por ocuparlo y explotarlo. Y el género de vida primitiva y rústica que en él se conocía no era tampoco adecuado para atraer a inmigrantes de habla latina acostumbrados a otros modos de existencia. No olvidemos, finalmente, que el Atlántico no tenía entonces como vía la importancia que adquirió siglos más tarde, y que falta toda prueba de que los antepasados de los vascos modernos tuvieran por las cosas del mar la señalada inclinación que éstos han venido mostrando desde el siglos XII por lo menos.

No podemos hacer más que conjeturas sobre el territorio que quedó definitívamente sin romanizar. En todo caso, podemos suponer que la lengua se mantuvo allí donde las huellas del poder y de los modos de vida romanos son tan escasos, es decir en buena parte de Vizcaya al este del Nervión, en Guipúzcoa, en el norte de Navarra y sin duda en la mayor parte del país Vasco-francés. En el valle de Oyarzun, Guipúzcoa, por ejemplo, a pesar de que las minas de plomo de Arditurri fueron inténsamente explotadas en esa época, no se ha encontrado el menor rastro de la antigua Oiasso, mencionada repetídamente por los geógra-

fos y que debió tener alguna importancia como puerto exportador [17]. Esta falta de rastros difícilmente puede compaginarse con la existencia de una ciudad de alguna consideración.

El latín pudo penetrar más o menos incluso en esta zona accidentada próxima al mar y a los Pirineos, de población segúramente dispersa sin núcleos considerables, de economía sencilla pero bien adaptada al medio. Por otra parte, pudieron sobrevivir islas de lengua indígena en zonas más abiertas, como la parte central de Navarra. No podemos afirmar nada con seguridad. No sabemos tampoco cuándo se romanizó el norte de Aragón y el Pirineo aquitano al este del País Vasco. Su romanización la sitúa R. Menéndez Pidal en los siglos VI-VII [18]. No hay, que sepamos, testimonios medievales de que aún siguiera usándose la lengua indígena en esos países.

El dominio de visigodos y francos en España y Francia no afectó a la romanización del País Vasco. Los vascos, con un espíritu rebelde y guerrero que contrasta notáblemente con su tranquila aceptación de la dominación romana, no acabaron de ser sometidos : contenidos y rechazados, vuelven una y otra vez a desbordarse hasta el llano al norte y al sur [19]. Donde antes reinaba el sosiego y la estabilidad, parece haber ahora un exceso de energía y un exceso de población que busca tierras más amplias y más ricas.

La principal creación política de los vascos fué, como es sabido, el reino de Navarra, aunque éste en ningún momento tuvo probablemente una población de habla exclusívamente vasca. También es bien conocida su aportación a la formación del reino de Castilla. Hacia el siglo X el vascuence se hablaba en zonas bastante extensas de la Rioja Alta y de Burgos. No hay completo acuerdo sobre la explicación de este hecho, pero resulta más natural pensar que es la consecuencia de la repoblación medieval. Por el lado de Aragón, en cambio, no hay pruebas de que la frontera lingüística haya variado mucho desde los comienzos del condado hasta casi nuestros días.

La historia subsiguiente del vascuence es la de su retroceso oscuro, lento durante bastantes siglos, mal documentado, en las zonas más llanas y expuestas, que eran al mismo tiempo fronterizas. Desde fines del siglo pasado, con la rápida industrialización de Vizcaya y Guipúzcoa, la lengua vasca se encontró ante un nuevo peligro, en condiciones muy distintas de las que podemos imaginar para la época romana. El país, lejos de ser pobre y oscuro, se convierte con el progreso técnico en un foco de atracción de inmigrantes de otra lengua. La rápida transformación se

[17] L. MICHELENA, « Guipúzcoa en la época romana », *Boletín de la R. Soc. Vascongada de Amigos del País*, 12 (1956), p. 69 ss.

[18] *Orígenes del español* [3], Madrid, 1950, mapa p. 464.

[19] Un buen resumen histórico se encuentra en F. H. JUNGEMANN, *La teoría del sustrato y los dialectos hispano-romances y gascones*, Madrid, 1955.

realiza conforme a las ideas de la época con un espíritu de total individualismo, favorecido por la desaparición o debilitamiento de las instituciones que en los siglos anteriores velaron con celo prolijo por la estabilidad social y la tradición del país. Los vascos, además, siempre se han mostrado muy orgullosos de su lengua, pero no se han preocupado tanto de cultivarla, a lo que sin duda ha contribuído la falta de centros superiores de cultura en el país. Se han contentado por lo general con considerar en abstracto la riqueza de sus posibilidades expresivas, sin tratar demasiado de actualizarlas. Con la transformación cada vez más rápida del mundo actual es difícil que el vascuence, como otros elementos de la cultura tradicional del pueblo vasco, pueda subsistir sin sufrir una profundo acomodación a los nuevos modos de vida. No hay necesidad de decir que la lengua, considerada en sí misma, es capaz, como otras de cualquier acomodación.

LES TÉLÉCOMMUNICATIONS DE 1780 A 1900 *

Introduction

Le besoin d'échanger rapidement des informations à longue distance, surtout pour l'administration, la guerre, les transports, etc., ressenti dès la plus haute antiquité, avait trouvé une satisfaction partielle dans des procédés utilisant la propagation de la lumière et du son, quand la découverte, en 1729, de la conductibilité électrique et la constatation de la rapidité de transfert des charges électriques le long d'un fil conducteur isolé du sol, suggérèrent l'idée de se servir pour la signalisation à distance de ce nouveau mode de propagation. Formulée en 1753, en Angleterre, par un auteur anonyme, l'idée donna lieu, dans le troisième quart du 18e siècle, à divers projets (Lesage, Lomond, etc.), dans lesquels les lettres de l'alphabet étaient transcrites par des combinaisons de signaux, soit successifs, soit simultanés (dans ce cas par plusieurs fils), formant un « code ». Le principe des conventions permettant l'intelligence de signaux est, dans une large mesure, indépendant du système transmetteur. Les âges précédents avaient fait connaître, parmi d'autres, deux procédés qui, *mutatis mutandis*, ont été largement utilisés par les télégraphistes contemporains : la reconnaissance d'un moment du déplacement de deux organes se mouvant synchroniquement aux deux postes correspondants (écoulement de l'eau dans deux réservoirs, d'Aeneas, cité par Polybe), et le code à cinq signaux du chancelier Bacon, dans lequel une lettre est identifiée par l'une des trente-deux combinaisons de cinq ensembles de deux signaux élémentaires *a* et *b* [1] (code binaire).

* Recommandé par M. René Taton, Directeur-Associé, Volume V.

[1] On sait l'importance de la numération binaire dans la nouvelle cybernétique.

Télégraphe optique

La difficulté de produire et de détecter des charges et décharges statiques rendit difficile au début la transmission électrique. Aussi la première exploitation régulière à longue distance fut-elle fondée sur la transmission de signaux lumineux par relais successifs (tours du télégraphe) espacés de 10 à 20 kilomètres. Elle fut l'œuvre de Claude Chappe et de ses frères qui, d'ailleurs, avaient d'abord pensé à une solution électrique, et y avaient renoncé. Les signaux de Chappe étaient distingués par la position, perçue par télescope, de trois bras (fig. 1) articulés aux

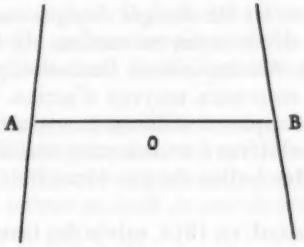

fig. 1

points O, A et B, et pouvant prendre toutes les positions angulaires respectivement autour de ces trois points. En fait, on limitait, pour la bonne visibilité, les écarts angulaires minimums à 45°, ce qui donnait 196 signaux distincts. La lenteur des manœuvres et celle des retransmissions de relais à relais ne permettaient pas d'envisager l'ouverture des communications au public. Dans ces conditions, il était intéressant que des signaux puissent représenter, en plus des lettres et des chiffres, un certain nombre de mots et de phrases appelés à revenir souvent dans des communications officielles, relatives à un nombre restreint de questions. Aujourd'hui encore, les sociétés utilisant le télégraphe pour leurs besoins commerciaux, emploient des codes particuliers à nombreux signaux composites. Au contraire, quand il s'est agi d'usagers nombreux et divers, on s'est vite aperçu qu'il était préférable de transmettre exclusivement les lettres, au moyen de combinaisons plus complexes de signaux élémentaires moins nombreux.

Le télégraphe de Chappe permit, en 1794, à la Convention Nationale d'apprendre en très peu de temps la prise de Condé par les troupes françaises, ce qui souleva l'étonnement admiratif de tous. Il fut alors créé un réseau de télégraphe optique, exploité par une administration

spéciale : il se développa peu à peu et reliait en 1842 Paris à toutes les grandes villes de France. Le système ne fonctionnait pas la nuit, à cause du fort éclairage nécessaire. En dehors de France, les réalisations furent limitées.

I. *TÉLÉGRAPHES ÉLECTRIQUES*

Le dernier appareil électrique utilisant l'électrostatique fut celui du physicien anglais Ronalds (1816), fondé sur la rotation synchrone de deux cadrans laissant apparaître successivement par une fenêtre les lettres inscrites sur leur pourtour ; des balles de sureau frappant la fenêtre quand la ligne avait été chargée désignaient la lettre voulue.

En 1799-1800, les découvertes successives de la pile et du courant continu (Volta), de la décomposition électrolytique des sels et acides (Davy), donnaient de nouveaux moyens d'action. En 1809, l'Allemand Sommering proposa un appareil utilisant trente-six lignes correspondant aux signaux, lettres et chiffres à transmettre, terminées par des voltamètres : le dégagement des bulles de gaz identifiait la ligne et par suite le signal.

La découverte d'Œrsted, en 1819, suivie des travaux d'Ampère, créant l'électromagnétisme, donna des procédés bien plus sûrs de détection du courant continu : d'abord boussoles galvanoscopiques, puis électroaimants. Ampère lui-même, sur une suggestion de Laplace, indiqua la possibilité de construire un télégraphe employant comme récepteurs des boussoles galvanoscopiques, au bout de vingt-huit lignes correspondant chacune à une lettre.

Cette proposition eut d'abord peu d'écho ; on ne peut signaler que quelques suggestions de Fechner, Schweigger, Ritchié, et d'autre part l'indication par Dyar (1829), en Amérique, d'un code de signaux différenciés par leur durée.

En 1833, Gauss et Weber, étudiant à Göttingen le magnétisme terrestre dans deux laboratoires distants d'environ 1 kilomètre, eurent l'idée d'utiliser l'électromagnétisme pour échanger des informations. Les émissions étaient produites par l'abaissement ou l'élévation d'un barreau de fer à l'intérieur d'une bobine de fils reliés à la ligne (application de l'induction électromagnétique découverte par Faraday en 1831). Les courants négatifs ou positifs ainsi produits étaient recueillis à l'autre extrémité par un galvanomètre, dont les déviations étaient lues sur une échelle divisée. On utilisait un code à cinq signaux (positifs et négatifs). La ligne de jonction était aérienne.

A peu près en même temps, le baron balte Schilling poursuivait des essais de télégraphe avec récepteurs à aiguilles (boussoles) en Russie et en Allemagne.

Premiers appareils pratiques

Après d'autres tentatives en Angleterre, en France, en Allemagne, l'année 1837 vit la naissance de trois appareils exploitables [2].

L'Anglais Cooke, ayant eu connaissance en Allemagne des essais de Schilling, se passionna pour la question et obtint le concours du physicien Wheatstone pour la réalisation et le contrôle de ses idées. Le premier appareil Cooke-Wheatstone comportait cinq fils ; on envoyait sur deux d'entre eux des émissions positives ou négatives, se traduisant à l'arrivée par la déviation d'aiguilles dont les directions convergeaient en un point sur lequel était écrite une lettre. Les inventeurs réduisirent ensuite le nombre de ligne à trois, puis à une, en adoptant un code à signaux successifs. L'appel était produit par la fermeture d'un circuit local, au moyen également d'une aiguille galvanoscopique. Dans ce circuit, la sonnerie était actionnée par l'armature d'un électroaimant. Ce fut le premier relais électrique.

Adopté par diverses compagnies ferroviaires anglaises, à partir de 1838, le télégraphe Wheatstone fut mis par elles à partir de 1842 à la disposition du public. De nombreuses compagnies d'exploitation se fondèrent, se réduisirent à deux au bout de peu de temps, et furent rachetées par la Poste en 1870.

A Munich, en 1837, Steinheil relia deux points distants d'environ 3 km. Le courant était produit par une magnéto à courant continu ; suivant le sens de rotation d'une manivelle, le courant émis était positif ou négatif. Au poste récepteur, deux aiguilles placées dans l'intérieur d'une bobine sont solidaires de petits siphons constamment remplis d'encre. Suivant le sens du courant envoyé dans la bobine, l'un ou l'autre des siphons est projeté sur une bande de papier qui se déroule constamment, et y dépose une trace. Ces traces successives se disposent ainsi sur deux lignes parallèles à l'axe de la bande et forment, par un code à cinq signaux, la représentation des lettres.

En 1837 également, les appareils du peintre américain Samuel Morse commencèrent à faire l'objet de démonstrations ; mais Morse affirma, avec témoins à l'appui, que ses travaux remontaient à 1832 lorsqu'au retour d'Europe, il avait été renseigné sur les électroaimants et la vitesse de l'électricité. Il utilisa le premier l'électroaimant pour produire, par l'action de son armature, attirée par le courant puis ramenée au repos par son poids ou par un ressort, le marquage d'un signe sur une bande de papier à déroulement continu. Son premier système ne comportait pas la différenciation des signaux par durées longues et brèves qui a fait

[2] Les appareils de Wheatstone, Steinheil et Morse furent l'objet de présentation à l'Académie des Sciences de Paris en 1838.

principalement sa célébrité ; il obligeait à la lecture d'un dictionnaire. Les émissions étaient déclenchées par le basculage d'un levier au passage de dents découpées à l'avance dans une bande de carton qu'on faisait avancer dans une rainure. Associé en 1837 à l'ingénieur Vail, Morse adopta le code de signaux qui porte son nom, ainsi que la manipulation directe grâce au « manipulateur » qui relie la ligne à la pile dans la position de travail, et au récepteur dans celle de repos. L'électroaimant inscripteur, qu'on savait encore mal dimensionner, agissait dans un circuit local que fermait et ouvrait un autre électroaimant branché sur la ligne et formant relais. L'auteur prévoyait dans ses brevets la possibilité de la lecture au son, et indiquait comme variante une réception électrochimique par inscription des points et traits sur une bande imprégnée d'électrolyte.

Ce ne fut qu'en 1843 que Morse obtint du Congrès américain un crédit de 30 000 dollars pour la réalisation d'une liaison « expérimentale » Washington-Baltimore. Le succès ayant été complet, une compagnie formée pour l'exploitation des brevets Morse donna des licences à des sociétés régionales qui, en quelques années, relièrent les principales villes. Il y eut aussi, quelque temps, des compagnies concurrentes.

En 1840, Cooke et Wheatstone, reprenant une idée émise dès 1836 par le premier, déposèrent le brevet du télégraphe à cadran qui, comme leurs appareils à aiguille, donnait une indication sans inscription. Au poste émetteur, une aiguille est mobile autour du centre d'un cadran, sur le pourtour duquel sont inscrites les lettres de l'alphabet. En faisant tourner l'aiguille, on produit au passage devant chaque signe, une émission de courant aussitôt interrompue. Au poste récepteur, ces alternances font avancer pas à pas une aiguille autour d'un disque semblable, par exemple en libérant un mécanisme tendant à faire tourner l'aiguille (ou le disque) puis en le bloquant à nouveau. Ainsi l'aiguille désigne à la fin de la manœuvre, comme à son début, la même lettre sur les deux cadrans. Cette commande « pas à pas », dont ce fut la première apparition, a, beaucoup plus tard, reçu de larges applications dans le téléphone automatique, la télécommande, la télémesure. L'appareil eut beaucoup de succès, et, pendant une vingtaine d'années, de nombreux inventeurs s'ingénièrent à le rendre plus rapide, à remplacer la manœuvre de l'aiguille par l'abaissement d'une touche d'un clavier libérant un mouvement d'horlogerie, puis l'arrêtant au moment voulu ; parmi les réalisations les plus intéressantes, il faut citer celles de Siemens en Allemagne (1849), de Bréguet et de Froment en France (1849-1850).

L'administrateur français des Lignes Télégraphiques (Optiques) obtint en 1845, avec l'appui d'Arago, un crédit pour la construction d'une liaison électrique Paris-Rouen, qui fut suivie de beaucoup d'autres. Il fit exploiter les premières lignes par l'appareil dit « français », comportant deux lignes au bout desquelles deux aiguilles se déplaçaient simultané-

ment devant deux cadrans accolés, donnant ainsi l'aspect de signaux Chappe, simplifiés par la suppression du bras central ; on obtenait soixante-quatre signaux distincts. Le service fut ouvert à la correspondance privée à la fin de 1850 en France, entre 1848 et 1852 [3] pour la plupart des autres pays d'Europe. L'exploitation y fut presque partout confiée à l'Etat, avec monopole.

Parmi les inventeurs de la décade 1840-1850, il faut citer le mécanicien écossais Bain, et signaler en particulier son appareil électro-chimique dans lequel les émissions longues et brèves se traduisaient, à la réception, par la décomposition au point de contact avec une pointe reliée à la ligne, d'une substance électrolysable dont était imprégnée la bande de papier à déroulement continu. Au départ, l'appareil comportait la composition préalable du message par perforation d'une bande de papier se déroulant entre un tambour et un frotteur, tous deux conducteurs et reliés respectivement à la ligne et à la pile. Au passage d'une perforation, le circuit de ligne se fermait. La longueur différente des perforations distinguait les points et les traits de l'alphabet Morse.

Les appareils de Bain eurent un certain succès, notamment en Amérique, où ils concurrencèrent quelque temps le système de Morse, jusqu'à ce que Morse eût gagné le procès en contrefaçon intenté à Bain [4]. Un seul réseau indépendant subsista alors, celui de House.

En Europe continentale également, le système Morse triompha entre 1850 et 1860. Une union austro-allemande, fondée par Steinheil, l'adopta en 1850 et les administrations européennes, France comprise, suivirent [5]. Le code fut un peu simplifié. En 1858-59, en Europe, on remplaça les premiers systèmes d'inscription de Morse (projection d'un crayon, puis marques de pointes sur la bande) par le procédé resté depuis lors en usage, dont John, en Hongrie, donna le principe, et Digney, en France, la réalisation pratique, et qui consistait à faire presser par l'armature de l'électroaimant une molette encreuse sur la bande. Ce perfectionnement, et celui des spécifications des électroaimants permit de brancher directement sur la ligne l'électroaimant inscripteur ; toutefois la pratique américaine maintint l'intercalation d'un relais et d'ailleurs développa la lecture au son, en remplaçant le système récepteur par un électroaimant à lourde armature (sounder), ce qui ne fut suivi que lentement en Europe.

[3] La Suisse fut le dernier pays à se décider, mais se plaça bientôt en tête par le nombre d'appareils en service rapporté au nombre d'habitants.

[4] Bain fut ruiné par le procès. Après le rachat des compagnies privées, le Post-Office lui accorda une pension en 1872.

[5] Les administrations continentales européennes accordèrent à Morse, en 1858, une gratification de 400 000 francs.

Appareils imprimeurs

Tous les appareils décrits jusqu'ici donnaient soit des signaux fugitifs, soit des indications écrites conventionnelles (codes). L'idée de faire écrire directement à distance les lettres et chiffres avait déjà été émise en 1838 par Vail, et le fut les années suivantes par d'autres, mais d'abord sans résultat.

Deux procédés furent envisagés : dans l'un (Highton, 1848), le signal formé pour chaque lettre aiguille à l'arrivée une pile locale sur un électroaimant particulier dont l'armature, de forme spéciale, projette sur le papier un appendice portant à son extrémité la lettre voulue, imprégnée d'encre. Le retour fait avancer le papier de la distance d'une lettre : c'est un peu le fonctionnement d'une machine à écrire. Mais le système obligeait à utiliser trois fils de ligne, et ne fut pas mis en service.

L'autre principe consiste à munir le pourtour d'une « roue des types » [6], tournant autour de son axe, des lettres et signes à transmettre, constamment imbibés d'encre : le fonctionnement de l'électroaimant presse une bande de papier sur la roue, imprimant la lettre qui se trouve alors au point de contact, fixe dans l'espace.

Le système à cadran, qui fait progresser pas à pas en même temps, aux deux postes, deux roues identiques, semblait permettre facilement l'impression ; mais comme le courant de ligne était employé pour la progression, il fallait pour l'impression soit une autre ligne, soit un organe complémentaire. Siemens, en Allemagne, Wheatstone lui-même, et bien d'autres, proposèrent entre 1848 et 1855 des solutions fondées sur le déclenchement, par inertie mécanique ou électrique, d'un électroaimant spécial. Mais la vitesse était insuffisante. Cependant un appareil House fonctionna en Amérique pendant quelques années sur le réseau House concurrent du groupe Morse.

Un autre procédé consiste évidemment à faire mouvoir en synchronisme rigoureux deux organes aux postes correspondants, mais le maintien d'un tel synchronisme est difficile. En 1854 un appareil Theiler réduisait cette difficulté en ramenant les appareils correspondants à la position de repos après chaque tour [7] ; il ne fut pas mis en service. Dans les autres systèmes, le mouvement était bloqué pendant l'impression. En 1855, le professeur américain Hughes produisit un appareil satisfaisant. Après l'avoir présenté aux sociétés américaines qui le modifièrent par des dispositions dues à son collaborateur Phelps (il remplaça alors l'ap-

[6] Ce principe ne semble pas avoir été breveté. On en attribue la paternité à Schweigger.

[7] C'est le principe des appareils « star-stop » qui, combiné avec la traduction des signaux, connaît maintenant un grand succès (téléimprimeurs).

pareil House), Hughes vint en Europe et mit au point définitivement son système avec la collaboration du constructeur français Froment. L'administration française l'adopta (1861) et le fit accepter pour le trafic international (1868) ; cependant son emploi resta limité, l'impression directe ne semblant pas, sauf en France, d'un intérêt majeur.

Le système Hughes utilisait un électroaimant polarisé (c'est-à-dire fixé par un aimant dans une position de repos) ; au poste émetteur, l'abaissement d'une touche d'un clavier correspondant à une lettre faisait saillir un goujon sur le pourtour d'un disque horizontal parcouru par un balai tournant que la rencontre du goujon soulevé faisait basculer en produisant l'émission du courant sur la ligne. Le fonctionnement de l'électroaimant récepteur libérait le mouvement d'un arbre spécial, faisant un tour complet pour un quart de tour de la roue des types [8], et produisant l'impression à la fin de son tour. Le marquage se faisait ainsi « au vol », sans arrêt de l'arbre de la roue des types. Le synchronisme, assuré approximativement par des volants et régulateurs, était achevé par un système de dents en prise assurant la position rigoureuse voulue au moment de la projection.

C'est également sur le principe du synchronisme que sont fondés les appareils télautographiques, c'est-à-dire reproduisant l'écriture même du scripteur, dont le mécanicien écossais Blackwell donna en 1846 la première réalisation. L'expéditeur écrit son message au moyen d'une encre conductrice sur un papier isolant [9] qui est ensuite enroulé sur un tambour à qui on impose un mouvement hélicoïdal, mettant ainsi successivement tous les points du papier en contact avec une pointe reliée à la ligne et faisant passer le courant aux points de conduction. A l'arrivée, un papier de même dimension recouvert d'électrolyte est animé d'un mouvement semblable et exploré par une autre pointe reliée à la ligne et dessine le message par décomposition des points de passage du courant. Ce principe fit ensuite l'objet de nombreuses propositions, dont celles de l'abbé Caselli (1855) et de Meyer (1872) en France. Mais il suscita peu d'intérêt, du moins commercial, ainsi que celui qui obtenait le même résultat par la décomposition en deux composants à un bout de la ligne et la reconstitution à l'autre du mouvement de la main de l'expéditeur [10].

[8] Ceci permettait à l'agent manipulant d'imprimer plusieurs lettres dans un tour, si celles-ci n'étaient pas dans le même quadrant.

[9] Ce peut être l'inverse.

[10] Première réalisation (Lacoinne) en 1857.

Lignes

Après les courtes lignes établies lors des premiers essais, il fallut constituer des lignes susceptibles d'assurer des communications stables et longues. On songea d'abord à la solution souterraine, au moyen de fils recouverts d'isolants, et tirés dans des tubes de verre, de plomb ou de poterie. Mais les isolants résineux employés se fendillaient, et on n'avait pas encore trouvé le moyen de les faire adhérer sans fissures au conducteur. L'essai tenté au début pour la ligne expérimentale de Morse fut désastreux. On adopta alors la solution aérienne, au moyen de poteaux en bois (le plus souvent en pin ou sapin, à cause de la rectitude des troncs), qu'on dut bientôt protéger contre les agents destructeurs du sol par imprégnation (procédé Boucheine à injection de sulfate de cuivre sous pression en France, créosote en Angleterre, chlorure de zinc en Allemagne). Au début, on employa le cuivre, à cause de sa forte conductibilité électrique. Mais son prix et sa faible résistance mécanique firent bientôt préférer le fer. D'autre part, dès 1838, Steinheil avait reconnu la possibilité du retour du courant par la terre, réduisant ainsi la ligne à un seul fil, et les essais ultérieurs confirmèrent cette possibilité. Le fil fut isolé du bois par des isolateurs fixés par des tiges sur les poteaux, et dont les formes varièrent beaucoup, ainsi que la nature. Finalement, vers 1860, on généralisa les isolateurs à cloche, en porcelaine, verre ou poterie, sur les sommets desquels était attaché le fil, la tige de fixation au poteau pénétrant dans l'intérieur de la cloche. En Angleterre, on fit quelque usage des fils souterrains. L'importation en Europe par Montgomery (1843) de la gutta-percha indonésienne procura un isolement meilleur et l'ingénieur allemand W. Siemens, simultanément avec des ingénieurs anglais, trouva le moyen de lui donner une bonne adhérence au fil ; Siemens décida le gouvernement prussien à construire (1848-1850) un réseau de câbles reliant Berlin à toutes les grandes villes d'Allemagne. Mais la gutta-percha se désagrège facilement quand elle est soumise, en milieu sec, à des différences rapides de température et le réseau devint vite inutilisable. Au contraire, la gutta convenait parfaitement comme isolant en mer et permit la construction et la pose en décembre 1851, après un échec l'année précédente, de la première liaison Calais-Douvres, puis les années suivantes, d'autres câbles reliant l'Angleterre aux différents Etats du continent. Le succès était dû, en particulier, à l'enroulement autour de l'isolant d'une enveloppe protectrice en fils de fer.

Mais la pose à longue distance et par grands fonds soulevait des problèmes plus redoutables. En ce qui concerne le rendement en signaux, on constata, sur les câbles précédents, un certain étalement et un retard dans ces signaux. Après essais au moyen de grandes longueurs de câbles enroulées dans des cuves, Wheatstone, Faraday, Siemens, montrèrent

que cet effet était dû à la capacité électrostatique des câbles qui constituaient, entre le fil de cuivre et la terre, une « gigantesque bouteille de Leyde », dont la gutta formait le diélectrique. En 1854, William Thomson donna une théorie complète de la propagation sur ces câbles à inductance négligeable (Kirchkoff, en 1857 [11], établit l'équation générale dite des « télégraphistes »). L'étude de Thomson montrait la nécessité de réduire le produit CR de la capacité par la résistance du câble. Des raisons mécaniques limitant le diamètre extérieur, il fallait trouver un compromis entre les deux termes du produit, dont le premier augmentait et le second diminuait avec le diamètre du cuivre. La notion de résistance électrique était encore mal définie et on ne possédait pas d'étalon stable et pratique pour la mesurer. La technique des câbles sous-marins se trouve à la base des travaux scientifiques entrepris dans ce domaine. Après 1859, Mattheisen montra l'influence sur la conductibilité du cuivre, d'impuretés, même légères, et une commission technique anglaise prépara la définition d'un étalon qui, sous le nom d'ohm, fut adopté universellement en 1881. W. Thomson, d'autre part, développa des appareils de mesure précis.

La pose par grands fonds présentait d'autres difficultés : moyens d'éviter des tensions excessives lors du déroulement, reconnaissance d'un parcours à fonds réguliers, précautions contre la formation de « coques », protection contre les détériorations des insectes sous-marins. Il fallait de plus assurer la souplesse de la ligne (fils câblés), la préservation et l'homogénéité de la gutta, les soudures (mélange Chatterton). Enfin, il fallait pouvoir relever et réutiliser les câbles coupés ou avariés. Ces problèmes ne furent résolus que progressivement. De 1855 à 1864, toutes les poses des grands câbles, méditerranéens, transatlantiques, arabo-indiens, échouèrent. Plusieurs compagnies fondées pour l'établissement de câbles anglo-américains (par Terre-Neuve) se succédèrent sans obtenir de résultats, malgré la constance, jamais découragée, du financier américain Cyrus Field. Enfin, en 1866, fut posé avec succès par le navire câblier « Great Eastern » le premier câble transatlantique, doublé l'année suivante par le relèvement et le prolongement du câble dont la pose avait échoué en cours de route en 1865. Plusieurs compagnies se fondèrent alors, une flotte de bateaux câbliers, presque tous anglais, se constitua, et en moins de dix ans les câbles traversèrent tous les Océans, le Pacifique excepté, et ne laissèrent hors de leur emprise que l'Afrique du Sud (120 000 kilomètres en 1875). Le rendement en signaux d'abord faible [12], s'éleva progressivement grâce à l'emploi du courant de repos (pour décharger la ligne) et de divers dispositifs. Pour l'exploitation, W. Thomson avait employé son galvanomètre à miroir supersensible,

[11] Annales de Poggendorff.
[12] Une dizaine de mots de 5 lettres par minute.

puis en 1872 il inventa le « siphon recorder », véritable oscillographe traçant sur une bande de papier, grâce à un siphon extra-léger contenant une encre fluide et solidaire de l'armature de l'électroaimant de ligne, la courbe continue des courants parvenant au poste récepteur. Tant que la déformation des signaux ne dépasse pas une certaine limite, un observateur exercé peut reconstituer leur forme originelle. Depuis lors, les « ondulateurs » à siphon, ou d'autres types, furent d'emploi général sur les grands câbles.

Appareils rapides

Les câbles exceptés, les lignes aériennes permettaient une transmission de signaux plus nombreux que ceux que pouvait leur envoyer la manipulation directe. Or l'organe créa vite le besoin, accru par l'extension simultanée des transports rapides, de l'industrie, des échanges commerciaux, etc., et le trafic sur les réseaux nationaux et internationaux créés de 1855 à 1860 s'accrut d'autant plus vite que les Etats, à partir de cette dernière date, pratiquèrent une politique de tarifs simples et bas. L'attention se porta alors sur les moyens de limiter au minimum le nombre de lignes correspondant à un trafic donné. On renonça à tous les systèmes employant plusieurs fils. Le rendement assuré par l'appareil Morse (10 à 15 mots de cinq lettres à la minute) parut insuffisant pour les grandes lignes. Quatre procédés furent envisagés pour accroître leur rendement :

1. *Duplex et quadruplex.* Dès 1852-53, des techniciens autrichiens et allemands avaient indiqué le moyen de faire fonctionner simultanément et indépendamment sur une même ligne deux communications en sens opposés, par l'emploi, à chaque extrémité, d'un montage différentiel dans lequel la ligne était équilibrée par un réseau électrique reproduisant ses caractéristiques vues de cette extrémité. Le système ne devint pratique que vers 1872, quand l'Américain Stearns montra la nécessité de constituer un réseau d'équilibre complexe, comportant notamment des condensateurs. Dans le montage Duplex, le courant au départ ne traverse pas le récepteur placé « en pont », et à l'arrivée ne trouble pas l'émission.

Le système duplex se répandit très vite, surtout dans les pays anglo-saxons et pour l'exploitation des câbles sous-marins (avec le réseau d'équilibre Muirhead, 1874).

D'autre part, on avait imaginé un autre moyen d'assurer aussi deux communications simultanées, mais de même sens (diplex), les signaux des deux sortes étant différenciés par leur polarité (récepteurs polarisés) et leur intensité (piles différentes, récepteurs plus ou moins sensibles).

Ce système se répandit en Amérique, et combiné avec le duplex donna le quadruplex Edison [13].

2. *Composition préalable.* Wheatstone, de 1855 à sa mort en 1875, réalisa et perfectionna constamment un appareil dans lequel la bande de papier préalablement perforée pour composer le message, se déroulait à grande vitesse dans l'appareil transmetteur. Les perforations formaient trois lignes parallèles, deux pour les signaux et le troisième, au milieu et à trous plus petits, pour l'entraînement de la bande sur une molette dentée. Le passage des perforations commandait le basculage de deux tiges solidaires d'un mouvement de balancier. Les signaux produits étaient ceux du code Morse. On réalisait normalement une vitesse d'environ 1600 mots à l'heure. Cet appareil eut une large extension en Angleterre et sur les câbles sous-marins.

3. *Télégraphe harmonique.* En 1837, l'Américain Page constata qu'un courant interrompu à fréquence rapide produit un son musical quand on le fait agir sur un récepteur comportant une partie susceptible de vibrer à cette fréquence. En 1860, l'abbé Laborde montra à l'Académie des Sciences de Paris qu'en intercalant entre une pile et une ligne des interrupteurs-vibrateurs coupant le circuit à un rythme spécial à chacun, et en plaçant sur la ligne un nombre égal de récepteurs à lames vibrantes respectivement accordées sur les fréquences différentes d'interruption, on faisait vibrer chaque lame à la commande de l'interrupteur correspondant, et de celui-là seul. Le principe de la fréquence porteuse du signal ainsi mis en lumière suggéra dans les années suivantes à quelques techniciens (dont Varley en Angleterre) l'idée d'utiliser une fréquence pour des fonctions auxiliaires. La première réalisation d'un appareil à communications multiples est celle du Danois La Cour, en 1873. La manipulation se faisait par la mise en action, entre la pile et la ligne, d'un diapason auto-interrupteur ; le passage du courant fermait, à l'arrivée, par la mise en jeu d'un autre diapason ou de tout autre récepteur accordé, le circuit local de réception. Au cours des essais, La Cour imagina la roue phonique, régulateur de synchronisme réglant la vitesse d'une roue munie de dents en métal magnétique, dont le mouvement est avancé ou retardé suivant le moment du passage du courant par rapport aux dents.

En 1874, Elisha Gay déposa en Amérique une demande de brevet pour ses appareils multiplex harmoniques à tige vibrante. Graham Bell étudia ce système, parallèlement avec le téléphone, mais l'abandonna après le succès de ce dernier. Elisha Gray, qui revendiqua aussi l'invention du téléphone, n'abandonna toutefois pas l'idée de la télégraphie harmonique. Mais bientôt ce principe parut sans intérêt devant le mul-

[13] La différenciation par les intensités de courant, souvent proposée en Europe, n'y fut jamais jugée assez sûre.

tiple à division du temps, et à partir de 1874 seul Mercadier, en France, continua à y consacrer ses efforts. Après l'invention du téléphone, il proposa comme récepteurs des téléphones accordés par fixation de points nodaux des plaques vibrantes. Malgré des essais encourageants, il ne put faire adopter nulle part son système et ce ne fut qu'en 1920 que le multiplex harmonique se développa.

4. *Multiple à division du temps.* Puisque la manipulation n'utilise pas tout le temps disponible pour la transmission des signaux, l'idée vint, au lieu d'envoyer simultanément plusieurs signaux sélectionnés à l'arrivée, de répartir le temps en courtes périodes divisées en quelques intervalles dont chacun correspond à une transmission différente. Chaque manipulant prépare son signal comme s'il était seul, mais le signal n'est envoyé sur la ligne que pendant l'intervalle qui lui est dévolu.

En 1852 l'Américain Moses Farner et le directeur des Télégraphes français Rouvier mirent en avant cette idée, mais seul Rouvier la suivit, d'abord avec l'appareil français, puis en 1858 avec le code Morse. Deux pendules oscillant synchroniquement aux deux postes portaient chacun un balai conducteur frottant successivement sur deux séries de contacts reliés alternativement à chacune des communications. Le synchronisme était maintenu par accrochage magnétique comme dans les horloges électriques.

En 1855 Whitehouse, en Angleterre, utilisa pour des appareils non multiples, un système distributeur rotatif à plots, dans lequel des touches abaissées pour former des combinaisons d'émissions restent enclenchées jusqu'au passage des plots voulus. En 1860, en Angleterre également, Burnett imagina un appareil multiple rapide à signaux Morse, dans lequel l'agent manipulant était averti par un son (cadence) du moment où il pourrait préparer la combinaison relative à une lettre.

Ce n'est qu'en 1872 qu'on vit une exploitation pratique du multiple à division du temps avec l'appareil quadruple de l'employé des Télégraphes français Meyer. L'aiguillage entre les quatre communications est assuré synchroniquement aux deux postes par un distributeur rotatif à plots, divisé en quatre secteurs, à douze plots par secteur (ce nombre permet de transmettre à chaque tour la plus longue lettre de l'alphabet Morse). Le synchronisme, grossièrement assuré par des volants et des régulateurs, est parachevé par un signal correcteur envoyé à la fin de chaque tour, et déclenchant à l'arrivée, suivant le plot qu'il rencontre, un serrage ou déserrage du frein du distributeur.

Situation en 1875

En 1875, dans les pays adhérant à l'Union Télégraphique fondée en 1865 et comprenant toute l'Europe, ses colonies, et la plupart des pays de l'Amérique du Sud et de l'Asie, la longueur des fils télégraphiques était de 1 178 000 kilomètres (sans les câbles sous-marins indiqués plus haut), le nombre des appareils de 16 000, le nombre annuel total des télégrammes de 11 millions. Aux Etats-Unis, exploités par des sociétés privées, la liaison New York - San Francisco avait été réalisée en 1865 et les chiffres étaient en 1875 les suivants : 123 000 kilomètres de fils, 17 500 000 télégrammes par an.

La grande majorité était desservie par le système Mora (vitesse moyenne 400 mots de 5 lettres à l'heure) ; un nombre restreint d'appareils rapides, des types divers indiqués ci-dessus, desservaient les lignes principales, avec une vitesse de 2 à 4 fois supérieure [14]. Sur les longues lignes, on intercalait des relais fonctionnant dans les deux sens de transmission. C'est à ce moment qu'apparut l'appareil Baudot, qui devait dominer la technique pendant plus d'un quart de siècle.

Le but visé par Eugène Baudot, employé des Télégraphes français, était d'associer le multiple à division du temps à l'impression directe. Commencés en 1872, ses travaux aboutirent en 1874 au dépôt d'un premier brevet, suivi pendant une dizaine d'années d'adjonctions et de modifications.

Adoptant le système de distributeur tournant, à plots séparés en autant de secteurs qu'il y a de communications indépendantes, Baudot choisit le code binaire à 5 émissions positives et négatives (32 combinaisons) envoyées sur la ligne par les 5 plots du secteur, et agissant à l'arrivée par l'intermédiaire d'un relais polarisé et des 5 plots du distributeur correspondant, à 5 électroaimants récepteurs, dont les armatures restent jusqu'à la fin du tour dans la position où les a mises la combinaison envoyée. Ceci permet — et c'est la nouveauté fondamentale du système — l'exploitation pendant le reste du tour, des effets de cette combinaison par un organe, le traducteur, spécial à chaque secteur, qui tourne synchroniquement avec le distributeur et déclenche l'impression en un moment précis, spécial à chaque combinaison : ainsi les 5 émissions successives sont « condensées » en un signal unique. Au début, Baudot appliquait simplement pour cette reconstitution le principe de la numération de base. Le fonctionnement de chaque électroaimant faisait avancer un même mobile d'un multiple de 2 égal à son rang [15]. Puis il

[14] Évaluation de l'administration française des Télégraphes (Annales télégraphiques, 1878).

[15] C'est en se fondant sur ce principe que Mimault, collègue de Baudot, auteur d'un brevet un peu antérieur, et sans intérêt pratique, l'attaqua en contrefaçon.

envisagea un procédé électrique, par lequel au moyen d'un disque à plusieurs couronnes divisées en plusieurs segments de longueur convenable explorés par des balais, le circuit de l'électroaimant imprimeur était fermé à un moment donné, différent suivant la combinaison des positions des armatures des électroaimants récepteurs. Enfin, il s'arrêta à un traducteur mécanique : l'impression résulte du basculage, sous l'action d'un ressort, d'un arbre porteur de 5 leviers parallèles. Une extrémité de l'un quelconque de ces leviers est déplacée lorsque fonctionne l'armature de l'électroaimant récepteur correspondant. L'arbre est bloqué par ces leviers, tant qu'une seule de leurs extrémités opposées, ou pieds, a devant elle un obstacle. Les obstacles sont constitués par les « pleins » d'une roue dans la position de repos ou ceux d'une autre roue, accolée à la première, dans la position déplacée. Les pleins d'une roue correspondent aux creux de l'autre, et toutes les deux tournent en synchronisme avec la roue des types. La répartition des pleins et des creux a été étudiée de façon qu'à chaque combinaison enregistrée corresponde un moment et un seul où tous les pieds des leviers se trouvent devant des creux. L'arbre alors bascule, déclenche l'impression et, en fin de tour, après progression du papier, tous les organes sont ramenés à la position de repos [16].

Une installation Baudot d'ensemble comprend donc 2 distributeurs tournant au synchronisme à chaque poste, et deux relais d'appel, et de plus, pour chaque secteur, au départ un manipulateur, à l'arrivée 5 électroaimants récepteurs, le traducteur et ses annexes. Le manipulateur est un clavier à 5 touches : averti par la « cadence », l'agent prépare la combinaison correspondant à une lettre : cette combinaison reste ensuite enclenchée jusqu'au passage des balais sur les plots du distributeur. Aux plots d'émission s'ajoutent sur ce distributeur un ou deux plots de correction rétablissant le synchronisme, comme dans l'appareil Meyer, mais on règle l'un de ces postes pour être à l'avance, et la correction se fait dans un seul sens.

Le type le plus courant fut le Baudot quadruple, mais on alla jusqu'à l'octuple. La vitesse normale fut de 120 tours par minute, soit, dans le quadruple, 8 lettres par seconde sur la ligne. Le système des échelonnements, c'est-à-dire le prolongement de la communication d'un ou plusieurs secteurs sur une autre installation (par exemple, Paris-Bordeaux faisant sur 2 secteurs Paris-Pau). A la fin de sa vie [17], Baudot imagina le « retransmetteur », évitant l'accumulation sur les longues lignes de la déformation des signaux : à un poste intermédiaire, deux distributeurs jumelés, dont les relais de l'un agissent comme des manipulateurs sur l'autre, assurent au tronçon suivant une reconstitution parfaite

[16] Dans des appareils ultérieurs dérivés du Baudot, un basculage du même genre se faisait par des jeux de peignes.

[17] Il mourut en 1913.

du signal, tant que la déformation due au tronçon précédent reste assez faible pour que les émissions n'empiètent pas d'un plot sur l'autre.

Adopté par l'administration française, l'appareil Baudot équipait à la fin du siècle la plupart des grandes artères françaises, et fut employé dans plusieurs pays d'Europe. Ailleurs, l'obligation du synchronisme et de l'orientation rigoureuse des distributeurs imposant un personnel de spécialistes, et la nécessité d'une instruction des manipulants effrayaient, malgré les avantages de vitesse et de souplesse de l'appareil. En Amérique et en Angleterre, on employa quelque temps l'appareil Delany, multiple non imprimeur utilisant le code Morse, mais très rapide. Différents appareils complexes furent utilisés en Amérique entre 1890 et 1900. Ce n'est qu'aux environs de 1900 qu'on mit au point des appareils imprimeurs, multiples ou non, inspirés du Baudot (Western Electric, Murray) à composition préalable. On chercha à employer la machine à écrire pour la préparation du message par perforation. Dans une autre direction, on vit apparaître des appareils ultra-rapides, utilisant la photographie (Siemens, Pollack et Virag).

L'exploitation télégraphique posa des problèmes difficiles qu'on ne peut détailler ici, notamment pour la distribution dans les grands centres, où Latimer Clark imagina les tubes pneumatiques installés d'abord à Londres (1856), puis à Paris, Berlin, et dans de grandes villes anglaises.

Dès 1850, l'ingénieur français Dumont, dans un brevet qui passa inaperçu, avait proposé la création de réseaux télégraphiques urbains, comportant un poste dans chaque bloc d'immeubles d'une grande ville : des bureaux de quartier et un bureau central permettraient la mise en relation télégraphique directe de deux quelconques de ces postes à la demande de l'un d'eux. A partir de 1860, des réalisations plus modestes eurent lieu en Angleterre et en Amérique pour relier entre eux des membres d'une même profession : banquiers, avocats, médecins.

Quoique semblant en liaison directe avec la télautographie, la téléphotographie ne connut aucune exploitation pratique avant 1900. L'ingénieur Lenoir, inventeur du moteur à explosion, déposa en 1877 une demande de brevet fondée sur le passage du courant quand un style explorateur rencontre les parties de la photographie où la lumière a décomposé la substance isolante impressionnée.

En 1900 la télégraphie électrique est à son apogée ; le téléphone ne lui fait pas encore une concurrence sérieuse, du moins sur les longues distances. Depuis 1875, la longueur des fils a triplé, le nombre des télégrammes quadruplé pour l'ensemble des pays adhérents à l'Union Télégraphique. La longueur des câbles sous-marins atteint 350 000 kilomètres. L'extension continuera encore, mais à un rythme graduellement décroissant.

Dès le début de la télégraphie (1838-1840), la plupart des protagonistes étudièrent et résolurent les problèmes connexes de la chronogra-

phie, de la commande électrique de l'heure, de la signalisation ferroviaire. Très vite, les lignes furent utilisées pour l'étude des courants telluriques, des orages magnétiques, pour la météorologie, la détermination précise des longitudes. La première application à la guerre eut lieu en 1859. En 1900, toutes les armées avaient des corps de télégraphistes.

II. *TÉLÉPHONE*

Au cours du 19e siècle, divers appareils, téléphone à ficelle, tuyaux acoustiques, haut-parleurs divers, furent imaginés pour augmenter la portée d'un signal sonore. Nous avons mentionné ci-dessus l'expérience de Page (1837) montrant la possibilité de produire des sons musicaux au bout d'une ligne en excitant, par des courants interrompus rythmiquement, des bobines entourant un noyau magnétique ; cette expérience fut à l'origine de la télégraphie harmonique, ainsi que de différents systèmes de signalisation audible, déjà désignés par le nom de téléphones. Le premier, le directeur des Télégraphes français, Bourseul, affirma en 1854 la possibilité de transmettre électriquement le langage (téléphone articulé). Il pensait qu'on y arriverait en commandant par la voix les vibrations d'une membrane solidaire d'une tige métallique dont les mouvements détermineraient les ouvertures et fermetures d'un circuit électrique. Cette idée fut traitée de chimère.

Dans les années suivantes, les travaux d'Helmholtz en Allemagne précisèrent les caractéristiques complexes des vibrations de la voix. A partir de 1860, et pendant une dizaine d'années, le professeur allemand Reis, de Francfort, imagina et perfectionna un « téléphone musical » fondé, comme l'avait indiqué Bourseul, sur les ruptures d'un circuit électrique provoquées par une membrane. Toutefois, il chercha à transmettre non seulement la hauteur des sons, mais leur amplitude et dans une certaine mesure leur timbre, en établissant entre les contacts un couplage lâche qui amortissait les coupures. Mais le langage était inintelligible.

Graham Bell, Ecossais naturalisé Américain, professeur dans une institution d'éducation des sourds-muets et des bègues, entreprit à partir de 1872, à Boston, des essais d'abord consacrés à l'établissement de télégraphie multiplex harmonique, comportant un électroaimant et un ressort d'acier ; une extrémité du ressort était fixée à un pôle de l'électroaimant, l'autre étant susceptible de vibrer devant l'autre pôle. Le poste de transmissions était muni d'un interrupteur qui, quand il entrait en action, mettait le ressort en vibration ; on ajustait le récepteur à l'extrémité pour vibrer synchroniquement. En juin 1875, lors d'un réglage, l'interruption

du circuit ayant été empêchée par la soudure du contact, Bell entendit son adjoint qui parlait dans la pièce voisine. Il comprit que ce n'était pas par des ruptures, mais en suivant sans arrêt les déplacements de l'air produits par la voix qu'on pourrait reproduire le langage et que l'induction électromagnétique fournirait le moyen de transformer les vibrations acoustiques en oscillations électriques. Il se hâta alors de déposer, au début de 1876, une première demande de brevet, plutôt de principe, et étudia fébrilement les dispositifs pratiques.

Les appareils récepteurs et transmetteurs étaient identiques, l'électro-aimant fut remplacé par un aimant permanent entouré d'une bobine dans un circuit sans pile, et l'action de la voix fut transmise par une membrane, d'abord en baudruche avec une pièce de fer placée en son centre, puis en fer. Toutefois, le brevet prévoyait aussi le moyen de produire le courant ondulatoire en faisant, à l'aide des vibrations de la membrane, descendre plus ou moins profondément une tige conductrice dans un liquide médiocre conducteur fermant le circuit. Quelques heures après le dépôt de la demande de brevet de Bell, Elisha Gray déposait un « caveat » décrivant un transmetteur du même genre.

La grande sensibilité du récepteur de Bell, transformant l'énergie électrique en énergie acoustique, avait comme contre-partie qu'il fallait au transmetteur une forte énergie sonore pour produire une énergie électrique utilisable. Dès qu'on voulut téléphoner à une certaine distance, on dut renoncer à employer le téléphone comme transmetteur. Divers ingénieurs pensèrent alors à utiliser l'action exercée par une pression sur la résistance électrique de contact de deux conducteurs, phénomène signalé par du Moncel en 1856 et utilisé par Clérac en 1865. Le premier brevet fut déposé par Berliner en 1877 (contact de 2 pièces métalliques dont l'une solidaire de la membrane). Edison, peu après, présenta diverses variantes dans lesquelles l'un des corps en contact était du charbon en poudre. Hughes étudia le phénomène et proposa, sous le nom de microphone, qui est resté, un appareil formé de crayons en charbon taillés en pointe et de deux plaques en charbon sur lesquelles les crayons reposaient, le tout fixé sur une planchette en bois devant laquelle on parlait. Edison, en 1878 [18] montra qu'on améliorait la transmission en intercalant entre le circuit local à faible résistance du microphone et la ligne, un transformateur élévateur de tension.

Le premier téléphone de Bell, présenté à l'Exposition américaine du Centenaire en 1876, souleva un grand enthousiasme, dont W. Thomson se fit l'écho en Europe. Une société se fonda pour exploiter les brevets Bell. Mais la Western Union (télégraphique), ayant acquis les brevets d'Elisha Gray et d'Edison, poursuivit Bell en contrefaçon. Après plusieurs années de discussion, la Cour Suprême américaine reconnut la

[18] Là encore il y eut des revendications de priorité (Elisha Gray, Berliner).

priorité de Graham Bell ; les deux sociétés fusionnèrent, en créant pour la fabrication des appareils une filiale, la Western Electric Co.

La mise au point de ces appareils, pour lesquels un nombre énorme de techniciens présentèrent des variantes sans grande nouveauté, aboutit dans la technique américaine au type de récepteur à aimant allongé bipolaire agissant sur une plaque en fer encastrée en son pourtour. Ailleurs, parurent les récepteurs-montres (Ader) et les transmetteurs-récepteurs combinés tenus à la main. L'idée de constituer des réseaux d'abonnés communiquant directement entre eux ne fut pas immédiate. Elle semble être venue d'abord aux exploitants des petits réseaux télégraphiques professionnels dont nous avons signalé la naissance en Amérique et qui reconnurent la supériorité pratique du téléphone. Aussitôt lancée, cette idée se répandit très rapidement aux Etats-Unis, et en quelques années les abonnés s'y comptaient par dizaines de milliers, répartis d'abord entre les deux sociétés concurrentes, puis fondus. Des sociétés d'exploitation furent constituées à partir de 1879 en Europe, mais l'extension fut beaucoup plus lente [19].

Durant les vingt années suivantes, les perfectionnements techniques s'aiguillèrent dans deux directions principales : l'extension de la portée des communications, et la réalisation de centraux de connexion de plus en plus importants, et de fonctionnement de plus en plus rapide et sûr.

1° On dut bientôt revenir à l'emploi des lignes bifilaires en cuivre, abandonnées au début de la télégraphie pour les lignes unifilaires en fer : le cuivre, bien meilleur conducteur, est de plus exempt des phénomènes ferromagnétiques et les lignes à retour par la terre s'induisaient entre elles. Toutefois, même le doublement ne suffit pas à empêcher ces inductions sur les parallélismes un peu longs. On dut croiser les fils de chaque circuit de distance en distance pour compenser l'action sur une section par l'action opposée sur une autre. On arriva, vers 1900, à une portée de 1000 à 1500 kilomètres sur les lignes aériennes en fil de cuivre de 4 à 5 millimètres de diamètre.

On dut également abandonner les câbles sous gutta à cause de leur forte capacité électrostatique, qui produisait un gros affaiblissement, beaucoup plus prononcé sur les vibrations les plus aiguës. L'emploi, comme isolant, de ruban de papier dans une enveloppe étanche de plomb empêchant la pénétration d'humidité, réduisit la capacité et permit la fabrication de câbles à nombreuses paires (les 2 fils de ligne étant enroulés en hélice l'un autour de l'autre pour empêcher les inductions) mais, en 1900, on ne pouvait encore constituer en câble des lignes dépassant 60 kilomètres. Le premier câble téléphonique sous-marin Calais-Douvres fut posé en 1891.

[19] A New-York environ 4000 abonnés en 1882, 8000 en 1887 avec 10 communications par jour et par abonné.

Entre 1880 et 1900, Heaviside, en Angleterre, étudia les conditions de la transmission des courants alternatifs de fréquence audible sur les lignes. Vaschy, en France, en même temps et indépendamment, aboutit à des résultats analogues. L'analyse de W. Thomson, en 1854, avait négligé la self-inductance qui ne joue pas de rôle sur les câbles sous-marins en basse fréquence. Les travaux des deux savants montrèrent qu'on pouvait reculer la portée des transmissions téléphoniques en augmentant artificiellement cette self-inductance. Ces conclusions parurent d'abord paradoxales ; cependant quelques essais furent entrepris, notamment en France. Ce ne fut toutefois qu'en 1899 que Pupin, aux Etats-Unis, donna une solution efficace en calculant à la fois les valeurs de bobines « de charge » intercalées de distance en distance sur les lignes et leurs espacements maximums. Mentionnons, enfin, que l'on chercha, avant 1900, à prolonger la portée par l'interposition de relais (comme en télégraphie) agissant dans les deux sens de transmission, mais on n'obtint pas de résultat pratique.

2° Bureaux centraux. La nécessité pour les abonnés de transmettre et de recevoir des appels imposait l'adjonction à leur poste d'un dispositif de type télégraphique. L'idée vint, presque immédiatement, de commander le passage entre téléphone et appel par la manœuvre de l'abonné décrochant son récepteur d'un crochet de suspension solidaire d'un levier commutateur [20]. Au bureau, le même changement était produit par la manœuvre d'une clef d'écoute. Une clef d'appel servait à appeler l'abonné. L'abonné appelait soit par une magnéto, soit au moyen d'un bouton reliant une pile à la ligne. Son appel parvenait à un « annonciateur », électroaimant dont l'armature, quand elle était attirée, laissait tomber un volet montrant le numéro de l'abonné et pouvant déclencher une sonnerie. Les lignes aboutissaient au bureau à des prises dans lesquelles l'enfoncement d'une mâchoire reliée par des cordons souples à ses dispositifs d'écoute et d'appel, permettait au téléphoniste de se mettre en rapport avec le demandeur. La multiplication des abonnés obligea à employer des ressorts de contact (Jacks) de dimensions réduites ; on les rangea côte à côte sur des réglettes disposées sur des panneaux verticaux. Des fiches au bout de cordons souples contenant des fils isolés les uns des autres pénétraient dans des douilles et y amenaient le contact avec les ressorts de lignes, qu'ils reliaient ainsi au poste de l'opérateur qui, au moyen d'un autre fil conjugué, pouvait se mettre en relation avec l'abonné demandé par un jack de la ligne de celui-ci. Comme il était impossible de placer sur un seul tableau devant un seul opérateur un grand nombre de jacks et d'annonciateurs, il fallut d'abord employer des lignes de liaison entre tableaux, puis on recourut au « multiple ». Chaque ligne est raccordée à un grand nombre de jacks (jacks généraux) tout le

[20] Brevet L. Roosevelt.

long d'un meuble, de façon qu'un opérateur quelconque puisse accéder à un jack d'une ligne quelconque, seuls des jacks d'appel avec annonciateurs étant maintenus sur un seul tableau. Il fallut des jacks de plus en plus petits, et aussi que chaque opérateur pût s'assurer que la ligne n'était pas prise ailleurs. Ce « test » fut réalisé par l'adjonction d'un troïsième fil aux jacks et aux cordons. De très nombreuses variantes furent présentées par divers techniciens, mais la plupart de celles qui furent adoptées provenaient de la Western Electric Co. (William, Scribner, etc.).

Un nouveau progrès fut l'emploi de signaux lumineux par la substitution de relais fermant le circuit de petites lampes aux annonciateurs d'appel et de fin. Enfin, à partir de 1892, se répandit, d'abord aux Etats-Unis, le système de la batterie centrale d'appel, envisagé sous diverses formes par Anders en 1881 (Angleterre) et d'autres, et mis au point par la Western Electric Co. Par ce système, le décrochage du récepteur de l'abonné produit automatiquement l'allumage de la lampe d'appel au central et la position des récepteurs des abonnés est constamment indiquée aux téléphonistes par l'extinction ou l'allumage de lampes sur les cordons de conversations, tout ceci grâce au maintien sur la ligne d'une batterie centrale du bureau. On compléta ensuite par le système de la batterie centrale intégrale, par laquelle le microphone de l'abonné, une fois son récepteur décroché, est alimenté par la batterie centrale du bureau, supprimant ainsi toute pile chez l'abonné.

Vers la fin du siècle, dans beaucoup de grandes villes des Etats-Unis et quelques-unes en Europe, le nombre des abonnés était tel (67 000 à New York, 30 000 à Chicago, 36 700 à Berlin, 25 400 à Paris), qu'on dut créer plusieurs centraux reliés par des lignes d'inter-communication avec des systèmes complexes de signalisation et d'exploitation.

L'idée de supprimer dans la mise en relation tout intermédiaire humain fut formulée dès 1879 (Connoly) et reçut quelques applications, mais surtout pour relier plusieurs abonnés sur une même ligne *(party lines)* sans déranger ceux qui n'étaient pas appelés. Elle reposait sur le principe d'appel « pas à pas » du vieux télégraphe à cadran. En 1889, Strowger, entrepreneur de travaux publics en Californie, prit son premier brevet, suivi de nombreuses additions et d'où sortirent, au début du siècle suivant, les premiers réseaux automatiques exploités.

En 1900, le nombre des abonnés au téléphone dans l'ensemble des Etats de l'Union Télégraphique était d'environ 1 million, celui des conversations de 1400 millions environ (1300 urbains et 100 interurbains) ; New York avait environ 67 000 abonnés et l'ensemble des Etats-Unis 1 356 000 [21].

[21] L'utilité de l'abonnement étant proportionnelle au nombre des postes pouvant être atteints, la croissance du nombre des abonnés a eu une allure exponentielle.

III. *TÉLÉGRAPHIE SANS FIL*

Dès le milieu du 19e siècle, on avait réalisé des communications sans fil, reposant soit sur l'induction entre circuits parallèles (par exemple, pour relier le continent à une île voisine), soit en créant des différences de potentiel entre deux prises de terre qu'influençaient deux autres prises (télégraphie par le sol, TPS, utilisée notamment en 1871 pour relier Paris assiégé à des postes extérieurs). D'autre part, il semble bien qu'en Amérique, Henry vers 1830, et Edison en 1875, aient réalisé des liaisons par ondes, sans s'en rendre compte.

La théorie électromagnétique de la lumière de Maxwell avait trouvé sa confirmation dans les expériences de Hertz qui, au moyen d'éclateurs, produisit et recueillit des ondes de l'ordre du mètre, et reproduisit avec elles les phénomènes de réflexion, réfraction, polarisation, etc., des ondes lumineuses. Mais les puissances étaient très faibles et il ne semble pas que Hertz ait cru à la possibilité d'une utilisation industrielle. En 1890 Branly, en France, développant des travaux antérieurs de Calzecchi-Onesti (Italie), montra que des décharges électriques à distance rendaient conductrices des limailles métalliques contenues dans un tube. Les nombreux professeurs qui, dans les universités du monde entier, cherchèrent à reproduire les expériences de Hertz, utilisèrent le tube de Branly pour la détection des ondes. En particulier en Angleterre, Lodge employa cet appareil, qu'il appela « cohéreur », pour former un circuit et faire fonctionner un appareil Morse. Un coup sur le tube ramenait celui-ci, après chaque décharge, à l'état isolant.

Entre 1890 et 1893, l'ingénieur américain Tesla fit, devant diverses sociétés d'Amérique et d'Europe, des conférences avec démonstrations : il produisait des ondes longues au moyen d'alternateurs à haute fréquence et faisait allumer des lampes et fonctionner des signaux à distance. Il prévoyait expressément l'application à la télégraphie et même au transport de force. Pour la réception, il employait des plaques métalliques formant condensateur. Ses procédés toutefois n'eurent pas de suite directe, sauf en ce qui concerne les bobines d'induction à haute fréquence.

En 1894 Popof, en Russie, qui étudiait les décharges atmosphériques pour en confirmer le caractère oscillatoire, eut l'idée de relier son dispositif détecteur, semblable à celui de Lodge, à une longue tige verticale (antenne), l'appareil étant mis à la terre. Il fit quelques expériences de transmission à courte distance. Turpain, en France, fit des essais de transmission en haute fréquence sur fils. Mais Marconi fut le premier à effectuer des communications de caractère commercial à une certaine distance. Ses appareils ne contenaient pas de nouveautés fondamentales ; il employait des éclateurs sur des circuits de puissance un peu augmentée par un dispositif dû à Righi, le circuit récepteur de Lodge fermant le circuit d'un appareil Morse, une antenne d'une trentaine de mètres, et

il parvint en 1895 et 1896, à établir des communications à des distances d'une dizaine de kilomètres entre un navire et la côte. Cette distance fut graduellement portée à 70 kilomètres en 1897, et à 136 en 1900. L'élévation de l'antenne, correspondant à une augmentation de la longueur d'onde, devait permettre en 1901 de recevoir en Angleterre des signaux envoyés de l'Amérique du Nord. C'est tout à fait à la fin du siècle que furent imaginés l'emploi de circuits agissant inductivement et non plus directement sur l'antenne, et la syntonisation en basse fréquence.

Télévision

Dès 1879, la réussite du téléphone fit concevoir l'espoir de traduire les ondes lumineuses en courant électrique et réciproquement, comme on avait déjà fait pour les ondes sonores. Un moyen s'offrait : en 1867 May, au cours d'une campagne de câbles sous-marins, avait observé que la résistance électrique du sélénium baissait sous l'action de la lumière : premier exemple d'une cellule photoélectrique.

L'étude la plus poussée fut celle de Nypkow (Allemagne) en 1884. Une source de lumière éclairait successivement de petites plaques de la scène à reproduire et le faisceau était dirigé ensuite sur une ou plusieurs cellules de sélénium : le balayage de la scène s'obtenait par l'interposition entre elle et la source d'un disque opaque percé de petits trous disposés en hélice et qu'on faisait tourner : à chaque trou correspondait une ligne. Le courant modulé par les variations de lumière sur le sélénium était employé à moduler à son tour un autre faisceau arrêté dans sa marche vers l'écran par le système connu de deux cristaux, l'un polarisateur, l'autre, à angle droit, analyseur. Nypkow utilisait la polarisation rotatoire magnétique (effet Faraday). Une bobine parcourue par le courant photoélectrique produisait entre les deux cristaux un champ magnétique qui, faisant tourner la direction de polarisation de la lumière d'un angle proportionnel à son intensité, faisait réapparaître la composante du faisceau parallèle à la direction de polarisation du second cristal, composante d'autant plus forte que l'intensité était plus grande.

On n'avait pas alors à sa disposition les moyens d'obtenir une fidélité suffisante, mais les idées fondamentales étaient déjà entrevues. En 1900 parut le tube Braun, à rayons cathodiques, qui devait fournir plus tard l'organe de récepteur de la Télévision.

CHEMICAL INDUSTRY, 1780-1900 *

THE last decades of the 18th Century saw the rise of chemistry as a science. The last decades of the 19th Century saw chemical industry taking on the characteristics of large-scale enterprise. The period between was a formative one during which chemical production changed from a small, haphazard, largely purposeless endeavor to a lively, ambitious industry. By the end of the 19th Century, the formative period had passed. Chemical industry had not yet reached the magnitude it was to acquire in the 20th Century, but the foundations were laid. Heavy chemicals like the mineral acids and sodium alkalies were readily available. The fine chemicals industry was likewise solidly founded in the synthetic dye and drug industry. The 20th Century development of fixed nitrogen, synthetic fibers, plastics, petrochemicals, synthetic rubber, and metal alloys could arise naturally out of the 19th Century background.

Many old established trades continued to function empirically without significant changes attributable to chemistry, *i.e.* soap-boiling, sugar refining, ceramics, glass, distillation. Others, such as bleaching, papermaking, food processing, and metallurgy, began to respond to chemical influences. In addition, new industries based on chemistry had their origins during this period, *i.e.* electrochemistry, synthetic dyes and drugs, photography, matches. Still other new industries were empirical in origin, but influenced chemical industry by contributing to its supply of working materials, *i.e.* coke and illuminating gas which contributed sulfur, ammonia, and coal-tar chemicals ; petroleum and natural gas which in the 20th Century contributed petrochemicals.

* Recommended by Prof. Charles MORAZÉ, Author-Editor, Vol. V.

Great Britain and France were foremost in the establishment of chemical industry at the beginning of the 19th Century. France quite naturally promoted such endeavors because of the great interest in chemistry aroused through the brilliant researches of Antoine Laurent Lavoisier (1743-94). Despite the political turmoil of the times, scientific pursuits were vigorously encouraged by the Revolutionary governments and the Napoleonic regime. Not only was there great progress in the understanding of chemical phenomena, but also in the application of the science to industrial problems. For various political and economic reasons the potential of French chemistry never materialized into a highly prosperous chemical industry and, as will be noticed, some of the most significant contributions of French chemists saw their successful application in England and Scotland. The industrial revolution saw its earliest and most vigorous development in Great Britain. It was natural for chemical industry to show an early development here, even though it never became more than adjunct to Britain's two primary industries, textiles and metals, both an outgrowth of the rise of steam power.

However, when chemical science had reached the point after mid-century that it could vigorously stimulate chemical industry, the British failed to show the enthusiasm necessary to maintain leadership. In the last three decades of the century, the Germans took over leadership in the production of all sorts of chemicals. Germany, through a combination of superior scientific education, government encouragement, and vigorous or even ruthless business practices, gained a virtual worldwide monopoly in many areas of chemical industry. Production of dyes and drugs, optical and chemical glassware, potassium and magnesium salts, and bromine compounds, was so completely under German control at the time of World War I that the Allied Nations were seriously handicapped during most of the war years.

CHARACTERISTICS OF CHEMICAL INDUSTRY IN 1780

At this time, chemical industry was very largely a small family-type business. It was no accident that so many chemical discoveries in the 17th and 18th Centuries were made by pharmacists. These businessmen supplied the townsfolk not only with drugs, but with spices, oils, pigments, dyestuffs, and chemicals. Such operators as Scheele, the Roses, the Gmelins, Baumé and Cadet were not only suppliers, but manufacturers of chemicals as well. Demand for many of their products was

small but the pharmacists had to have the preparative skill necessary to supply the demand.

A few items were in sufficient demand to require large-scale operations in their preparation. Sulfuric acid, which originally was prepared in small amounts by alchemists and pharmacists, had been made industrially since 1720 in Britain. For alkalies, users, such as soapmakers and glassmakers, were dependent on potash (potassium carbonate) leached from wood ashes or the sodium equivalent produced from the ashes of sea plants or imported from Egypt. Lime prepared by the burning of limestone was also used as an alkali, but was of restricted value because of its poor solubility.

A few salts were being produced. Common salt (sodium chloride), used to flavor and preserve food, was produced in many localities by evaporation of sea water or by mining rock salt. Alum for mordanting was prepared in countries having suitable aluminium-containing minerals. White lead was prepared for use as a paint pigment by exposing strips of lead to the vapors of vinegar and fermenting manure or tanbark. Prussian blue, a ferrocyanide of iron, was another popular pigment. Saltpeter (potassium nitrate) for gunpowder was widely prepared from nitrates leached out of decomposing organic matter. It was used primarily for black gunpowder.

Gunpowder for the world's armies, explorers and hunters, was a common article of manufacture in many quarters. In some cases, as in France, production was controlled by the government. Elsewhere, anyone with the proper knowledge could manufacture it. It was composed of saltpeter, sulfur and charcoal. The sulfur came chiefly from Sicilian mines. Charcoal for gunpowder and for smelting metallic ores was produced wherever there were suitable forests. Demand for this substance was so great as to cause serious depletion of forests in Britain, Germany, and elsewhere before the introduction of coke for iron smelting by the first Abraham Darby in 1735.

Forests were also a source of the naval stores, pitch, tar, and turpentine, used extensively in the sailing vessels of the day. These substances came chiefly from the coniferous forests of Scandinavia and North America. Tanning materials, such as oak bark, were gathered wherever suitable plants were growing. Dyes were all of natural origin, the principal dyestuffs being madder, indigo and logwood from plant sources, and cochineal, extracted from an insect native of Central America.

Almost always these chemical products were prepared on a small scale. Quality was extremely variable, being dependent on the skill of the operator and the quality of source materials. In some cases there were essentially no changes during the next century. In others, changes were rapid and profound.

SULFURIC ACID PRODUCTION

From alchemical days up to the present sulfuric acid has held a place of first importance among acids. Its strength as an acid, its oxidizing power, its dehydrating power, its low volatility, and its comparative cheapness, have made it the primary acid of commerce. From the thirteenth century, it was produced by the distillation of green vitriol (ferrous sulfate), hence the common name "oil of vitriol". In the 17th Century, it began to be produced by the bell process where sulfur was burned in glass bells or in large flasks with water at the bottom. When saltpeter was mixed with the sulfur and set afire in the flask there was an evolution of sulfur trioxide which dissolved in the water to give dilute sulfuric acid. By many repetitions of the sulfur-burning, an acid of moderate concentration was obtained [1]. The acid was used chiefly in medicine either directly or for the preparation of the laxative, Glauber's salt (sodium sulfate), and for assaying of metals.

Production remained small into the 18th Century. Not until lead chambers were substituted for glass vessels by John Roebuck (1718-94) of Birmingham, in 1746, did production increase in magnitude. Roebuck and Samuel Garbett (1717-1805) opened another plant at Prestonpans, near Edinburgh, in 1749. Competitors were soon attracted by the success of Roebuck's operations. Workmen in his employ were induced to reveal secrets and even join competitors. Lead chamber plants began operation elsewhere in England and Scotland from 1756. The first lead chambers in France were introduced by John Holker at Rouen in 1766. Expanded production quickly lowered prices to the point where the acid became important in textile bleaching and metal cleaning [2].

For a time, innovations in manufacture consisted primarily in enlargement of chambers but slowly new ideas gained hold. Steam was introduced into the Rouen chambers during combustion in 1774. In 1793, Nicolas Clément (d. 1842) and Charles Bernard Désormes (1777-1862) introduced a continuous flow of air into the chambers, and subsequently showed that this made possible a significant saving of saltpeter [3]. Separate burners for sulfur were developed and brought into use about 1810 at Rouen by Jean Holker, grandson of the founder of the French industry. Continuous burning of sulfur may have been introduced even earlier

[1] Samuel PARKES, *Chemical Essays principally relating to the Arts and Manufactures of the British Dominions*, 3rd. ed. (London, 1830), pp. 212-14.

[2] *Ibid.*, pp. 216-19; George LUNGE, *A Theoretical and Practical Treatise on the Manufacture of Sulphuric Acid and Alkali*, 3rd. ed. (London, 1903), Vol. I, pp. 8-9; A. CLOW and N. CLOW, *The Chemical Revolution* (London, 1952), pp. 132-44.

[3] C. B. DÉSORMES and N. CLÉMENT, "Théorie de la fabrication de l'acide sulfurique", *Ann. Chimiques*, 59 (1806), pp. 329-39.

in England. From this time forward the conversion to continuous operations took place rapidly [4].

The acid formed in the chambers was concentrated to sixty percent concentration by heating in lead pans, to higher concentrations by heating in glass since more concentrated acid attacked lead. The precarious heating in glass began to be supplanted after 1814 by platinum stills, first used by John Harrisson (1773-1833), a small producer in Philadelphia [5].

The chamber process was wasteful of nitrate and productive of a nuisance since the spent gases were discharged into the atmosphere. Joseph Louis Gay-Lussac (1778-1850), in 1827, suggested absorbing the oxides of nitrogen in the spent gases by passing them through strong sulfuric acid trickling over a bed of coke in a suitable tower, but the scheme was not tried industrially until 1842, and was not generally adopted until the invention of the Glover tower in 1859.

John Glover (1817-1902) was an English acid manufacturer who found that the nitrogen oxides absorbed by the acid in the Gay-Lussac tower might be recovered for reuse if the nitrified acid from the Gay-Lussac tower were diluted and exposed to hot sulfur dioxide. This could be done in a tower where the Gay-Lussac acid was introduced at the top together with more dilute acid from the chambers. While trickling through the Glover tower, the acid came into contact with hot sulfur dioxide from the sulfur burners. The gases were cooled down to a proper temperature for admission to the lead chambers, the oxides of nitrogen were released for reuse, water was boiled out of the descending acid, providing steam for the chambers, while concentrating the acid to seventy-eight percent concentration for reuse in the Gay-Lussac towers. The towers thus complemented one another and made the chamber process a much more efficient operation [6].

With the rise of the synthetic dye industry there arose an abnormal demand for highly concentrated acid, indeed an acid containing free sulfur trioxide dissolved in pure acid, a product named "oleum" or "fuming sulfuric acid". Such an acid had been produced in small amounts since 1755, at Nordhausen, in Saxony, by dissolving sulfur trioxide, obtained by distilling ferrous sulfate, in acid which had already been concentrated by boiling [7].

Another process for making oleum was developed about 1875 by Rudolph Messel (1847-1920), a German-trained chemist employed by Squire, Chapman & Co. in England. Sulfuric acid itself was decomposed

[4] LUNGE, *op. cit.*, pp. 9-10.
[5] Williams HAYNES, *American Chemical Industry* (New York, 1954), Vol. I, p. 178.
[6] A. FINDLAY, *A Hundred Years of Chemistry*, 2nd ed. (London, 1948), p. 259.
[7] LUNGE, *op. cit.*, Vol. I, pp. 959-962.

over platinum to obtain pure oxygen and sulfur dioxide. These gases were then recombined over a platinum catalyst to form sulfur trioxide which was dissolved in concentrated acid to produce oleum [8].

The fact that finely-divided platinum was capable of stimulating reactions between gases without being consumed was known to Humphrey Davy (1778-1829) in 1817. Other chemists studied the phenomenon and J. J. Berzélius (1779-1848) applied the term "catalyst" to an agent which affected the speed of a reaction without being consumed. In 1831, Perigrine Phillips, a vinegar manufacturer of Bristol, attempted to prepare sulfur trioxide by catalytic oxidation over platinum but without success. Only after the demand for oleum by the dye industry became acute did the catalytic process receive extensive study. About 1870, Messel learnt that the ineffectiveness of the catalyst was due to poisoning by impurities in the sulfur dioxide. The problem was further elucidated twenty-fixe years later by Rudolf Knietsch (1854-1906) who pointed out that arsenic compounds were responsible for loss of catalytic activity [9]. Knietsch devoted years of research to the problem of catalyst poisons as chemist for the Badische Anilin und Soda Fabrik at Ludwigshafen. He showed that only when extreme precautions were taken to prevent poisoning of the catalyst was the contact process for sulfuric acid a successful one. The Badische firm became the leading producer of high-concentration sulfuric acid, though the contact process spread throughout the world in the 20th Century, giving the chamber process serious competition though never driving it completely out of existence.

In the early days of the chamber process, the sulfur dioxide used for acid manufacture came almost entirely from Sicilian sulfur. From 1818, certain producers began experimenting with burners capable of roasting iron pyrites (iron disulfide) as an alternative source of sulfur dioxide. The turn to pyrites became extensive after 1835, when the price of sulfur became unreasonably high following the granting of an export monopoly on Sicilian sulfur. Pyrites occurred in Spain, Wales and Ireland in sufficient quantities to encourage a shift to this source of sulfur. Other sulfide ores, such as those of lead and zinc were also brought into use, as was spent iron oxide used in the purification of coal gas [10].

The end of the century saw Herman Frasch (1851-1914), an American chemical engineer, at work on his process for extracting sulfur from Louisiana salt domes. By pumping superheated water down into the deposit, it was possible to melt the sulfur and raise it to the surface with the aid of compressed air. The process did not throw sulfur on the inter-

[8] S. Miall, *A History of the British Chemical Industry* (London, 1931), pp. 31-35.
[9] R. Knietsch, "Ueber die Schwefelsaure und ihre Fabrikation nach dem Contactverfahren", *Ber. Deutsche Chem. Gez.*, 34 (1901), pp. 4069-4115.
[10] Lunge, *op. cit.*, pp. 36-60 ; Haynes, *op. cit.*, pp. 260-261.

national market until the 20th Century began. It then had a disruptive effect on the Sicilian industry and also replaced pyrites as a sulfur source in many sulfuric acid plants [11].

OTHER INORGANIC ACIDS

The only other inorganic acids of primary importance were hydrochloric and nitric. They were secondary to sulfuric acid and were used only when their particular properties gave an advantage over sulfuric. Both of them were produced by the action of sulfuric acid on, respectively, rock salt and commercial nitrates. Up until the 1830's saltpeter was the source of nitrate for nitric acid. Then, when the Chilean nitrate deposits began to be exploited after 1837, the cheaper sodium nitrate came into use for nitric acid production and even for the preparation of saltpeter [12].

ALKALI CARBONATES

An increasing French demand for inexpensive alkalies was highlighted in 1775 when the *Académie des Sciences* offered a prize of 2400 livres for a successful process for making soda from common salt. France was dependent for alkali on imports of soda from the natron lakes of Egypt, "barilla" produced from the ashes of saltwort along the coast of Spain, or potash from America or Northern Europe, any of which might easily be cut off by the British Navy.

A suitable process, based upon a generally known but previously unsuccessful method, was developed by Nicolas Leblanc (1742-1806) who opened a factory at St. Denis, near Paris, in 1791. The process utilized sodium sulfate produced by the reaction of common salt with sulfuric acid. This was reduced to sodium sulfide with carbon. Following treatment with limestone, during which calcium sulfide and sodium carbonate were formed, the latter could be separated from the mixture. As a result of the political turmoil then occurring in France, the prize was never awarded to Leblanc. His factory was a financial failure and, following a sequence of reverses, he committed suicide in 1806 [13].

[11] HAYNES, *op. cit.*, pp. 266-268.

[12] M. B. DONALD, "History of the Chile Nitrate Industry", *Ann. Science*, 1 (1936), pp. 29-47, 193-216.

[13] A. ANASTASI, *Nicolas Leblanc, sa vie, ses travaux, et l'histoire de la soude artificielle* (Paris, 1884) ; Desmond REILLY, "Salts, Acids and Alkalies in the 19th Century", *Isis*, 42 (1951), pp. 287-296.

Success with the Leblanc process was finally achieved in England when James Muspratt (1793-1886) established a soda works at Liverpool in 1823. Muspratt was an Irishman who had previously been engaged in chemical manufacture in Dublin. In 1822, he started to manufacture sulfuric acid in Liverpool, and the next year extended his operations into the production of soda [14].

Other manufactures established alkali works in the years that followed, that of Josias Christopher Gamble (1776-1848) in Glasgow (1825) being of particular importance. Encouragement came in the repeal of the Salt Tax in 1827. Handicaps arose in the form of litigation brought by nearby landholders who objected to the devastation caused by the hydrochloric and sulfureous fumes given off in the process. This problem remained a troublesome one for soda manufacturers for many years. William Gossage (1799-1877), in 1836, attempted the absorption of the hydrogen chloride gas in water trickling over brush in a large tower. Consideration was even given to carrying on manufacture on a barge anchored in the English Channel. The British government passed the Alkali Act in 1863, providing for close inspection of manufacturers and heavy penalties for those who violated the provisions regarding disposal of waste gases [15].

By the end of another decade, the problem became unimportant due to the development of the Deacon process for converting hydrogen chloride to chlorine, and the Weldon process for recovering the expensive manganese commonly used in chlorine production. Both of these processes had an influence on the bleaching industry and will be treated further under that subject.

Sulfuric acid was used in great quantities in soda manufacture and large amounts of sulfur were being thrown away with the calcium sulfide waste from the Leblanc process. In addition to this, the calcium sulfide waste created an unpleasant nuisance. Repeated attempts were made to recover the sulfur from this waste product with a general lack of success. Gossage attempted to treat the sulfide with flue gases containing carbon dioxide, with minor success in recovering sulfur in the form of hydrogen sulfide. In extending this idea, Alexander M. Chance (1844-1917) of the firm of Chance Brothers, succeeded in modifying the process whereby the sulfur could be efficiently recovered. The hydrogen sulfide thus produced could be heated over iron oxide catalyst to give sulfur and water vapor. This sulfur was then available for acid production.

These developments enabled the Leblanc process to survive the century, but, during the last three decades, it was losing a battle for

[14] J. F. Allen, *Some Founders of the Chemical Industry* (London, 1906), pp. 69-100.
[15] Miall, *op. cit.*, p. 7; T. I. Williams, *The Chemical Industry* (London, 1953), p. 43.

economic survival with the ammonia-soda process developed by Ernest Solvay (1838-1922). As early as 1811, Augustin Jean Fresnel (1788-1827) discovered that ammonium bicarbonate and salt react to give sodium bicarbonate and ammonium chloride. The sodium bicarbonate may be used directly as baking soda, or by heating can be readily converted to soda ash. Fresnel made no attempt to commercialize the process, but during the next fifty years, there were a number of attempts, particularly in Britain, to do so, but without success. Solvay, a Belgian chemical engineer, began operations in a plant in Couillet, Belgium, with his brother Alfred, in 1865. The Solvay brothers succeeded in putting operations on a continuous basis and instituting economies by recovery and recycling of ammonia. By 1869, they had greatly expanded their plant at Couillet. Several years later, the *Société Solvay & Cie* built a new factory at Dombasle, in northeastern France. A licence for British manufacture was granted to Brunner, Mond and Co. in 1873. Solvay plants began operation in Russia and America in 1881, in Germany and Austria in 1885, and in other countries in subsequent years. By the end of the century, world production had reached 1.700.000 metric tons, ninety percent of it by the Solvay process. World production had been 270.000 metric tons in 1863. Prices dropped from thirteen pounds per ton in 1863 to four pounds per ton in 1900. Leblanc plants soon found the competition too keen to combat, even with increased efficiencies and utilization of by-products. A last effort to hold forth against the Solvay process was made in 1890, when 45 firms in Britain consolidated to form the United Alkali Co. Ltd. By closing down the more inefficient plants, competition was maintained a little longer, but the fight was a losing one, although the combine was successful in the production of other chemicals [16].

HYDROXIDES

At the end of the 19th Century, a new trend in alkali production was developing as the result of the growth of the electrochemicals industry. Direct production of sodium hydroxide from common salt was a result. Up to this time, sodium and potassium hydroxides had been produced when strong alkalies were needed, as in soapmaking, by treating the appropriate carbonate with calcium hydroxide. The latter was easily prepared as a sludge by the slaking of quicklime (calcium oxide) prepared in large amounts by the calcining or "burning" of naturally abundant

[16] Gilbert T. MORGAN and D. D. PRATT, *British Chemical Industry* (London, 1938), pp. 8-11 ; MIALL, *op. cit.*, pp. 12-22 ; REILLY, *op. cit.*, p. 291.

limestone (calcium carbonate). The quicklime was slaked with water and mixed with sand to give builders' mortar. It was also used as an alkali directly although its limited solubility prevented its application in many places.

The fact that sodium hydroxide is produced at the cathode during electrolysis of sodium chloride solution had been noted by William Cruickshank in 1800. Charles Watt of England suggested in 1851 that the alkali might be produced commercially by electrolysis but this was economically out of the question until the practical development of the electric generator. Other practical difficulties also had to be overcome and it was only in 1800 that the electrolytic process was initiated by the *Griesheim-Elektron Werke* in Germany.

Hamilton Y. Castner (1858-99), an American who came to London in 1886 to exploit a process for making sodium and potassium for use in aluminium production, failed in his direct objective, but succeeded in 1891 in developing an electrolytic process for isolating sodium hydroxide from salt brine. Essentially the same process was invented simultaneously by Carl Kellner, an Austrian chemist. Castner and Kellner joined in exploiting their patents, the Castner-Kellner cell attaining primary importance in the worldwide production of strong alkali. The cell is so designed as to electrolyze brine in the presence of a mercury cathode. Sodium and chlorine are electrolysis products, the chlorine being drawn from the cell as a gas, the sodium forming an amalgam with the mercury. This amalgam is subsequently decomposed with water to obtain hydrogen and sodium hydroxide [17].

SALTS

The production of the principal salts in use during the period saw minor rather than major changes. Sodium chloride continued to be evaporated from sea water and mined from rock salt deposits as had been the case earlier. Demand for the compound increased greatly however, with the expansion of soda production and the increasing demand for chlorine. It was also converted into a wide variety of sodium compounds having highly specialized uses. Sodium chloride was, therefore, a primary chemical but, because of its abundance, supply problems were seldom serious.

Potassium salts were produced chiefly from potash and saltpeter until the potassium salt deposits of Stassfurt, in Germany, began to be

[17] V. H. Lord, "Hamilton Young Castner", *J. Chem. Educ.*, 19 (1942), pp. 353-356; Haynes, *op. cit.*, pp. 269-284.

mined toward the end of the 19th Century. These deposits represented unique beds of chlorides, bromides, and sulfates of potassium, magnesium and sodium. Their development by the German chemical industry after 1860 enabled Germany to become the world's supplier of chemicals based on potassium, magnesium and bromine.

Since salts of various types figure in so many fields of industrial chemistry, it is more appropriate to discuss these salts in the areas where they take on importance and that policy will be followed in this chapter.

SOAP

Up until the beginning of the 19th Century, soapmaking was a technological art little influenced by science. Then several innovations had the effect of stabilizing production and improving quality. Steam heating, improved alkalies, and an understanding of the chemical nature of fatty oils together, were responsible for the change. Steam heating was a technological development, but the other two were chemical. The introduction of Leblanc soda provided a more uniform alkali than had been possible when depending on potash and "barilla". More important, the development of simple titration procedures for the estimation of alkali content by Louis Nicolas Vauquelin (1763-1829) meant that soapmakers were able to demand soda of high quality. A further development was the production of solid caustic (sodium hydroxide) from mid-century [18].

The elucidation of the nature of fatty oils was accomplished by Michel Eugène Chevreul (1786-1889) in the decade following 1811. He showed that fatty oils were combinations of fatty acids and glycerol which, on heating with alkali, decomposed to give soap and glycerol. Chevreul isolated and analyzed several of the fatty acids. His work had the effect of placing soap production on a systematic basis since it was now possible to use appropriate fats for the production of desired types of soap [19]. During the century, there was extensive expansion of the soap industry with simultaneous extension of whaling and of the production of oil seeds.

[18] F. W. Gibbs, "The History of the Manufacture of Soap", *Ann. Science*, 4 (1939), pp. 181-190 ; Clow and Clow, *op. cit.*, pp. 116-129 ; Miall, *op. cit.*, pp. 226-243.

[19] M. E. Chevreul, *Recherches sur les corps gras d'origine animale* (Paris, 1823), and numerous papers in *Ann. Chim.* from 1813

BLEACHING CHEMICALS

Bleaching of yarn and cloth had been dependent up to the 19th Century on the action of sunlight. Large areas of land were in use as bleach fields in major textile producing centers. Crude chemical agents were used to assist in removing coloring matter. The acid in buttermilk assisted in removing from the yarn such minerals as would act as mordants toward coloring matter. The ashes of wood or kelp helped to remove alkali-soluble substances. When sulfuric acid manufacture increased, Roebuck succeeded in getting Scottish linen bleachers to substitute the acid for buttermilk, a substance not as plentiful in Scotland as it was in Holland. Basically, however, the chemicals were mere adjuncts and dependence was primarily on sunlight.

It was in 1785 that Claude Louis Berthollet (1748-1882) observed that aqueous chlorine solutions had a strong decolorizing effect on cloth and he recommended that chlorine be used as a bleach. Travellers to Paris, such as Professor Patrick Copland of Aberdeen, and James Watt of Glasgow, brought the technique to Scotland where it was found successful as a bleach, but difficult to handle since chlorine gas must be generated from hydrochloric acid and manganese dioxide [20].

At this point, bleachers at Javel, in France, and Berthollet, found that a more stable product, *eau de Javel*, could be produced by dissolving chlorine gas in potassium hydroxide solution. Manufacture was a commercial failure both at Javel and later at Liverpool because of transportation problems. Charles Tennant (1768-1838), a Scottish bleacher, then found that bleach liquor could be made by passing chlorine gas into a sludge of calcium hydroxide. This was soon improved by his associate, Charles MacIntosh (1766-1843), to give a dry bleaching powder (a hypochlorite of calcium) which could be transported easily. Tennant obtained a patent on the product in 1799 and began manufacture. The St. Rollox Works, which he and his partners established in Glasgow, expanded into the production of sulfuric acid, soda and soap to become one of the largest producers of chemicals in Europe. The Tennant family remained active in chemical production during the entire century [21].

Manganese dioxide, the oxidizing agent used to liberate chlorine from hydrochloric acid, occurs naturally but is not abundant. It was a source of major expense in chlorine production and prevented the adoption of chlorine bleaches on a larger scale. Various efforts were made to cut this expense. Gossage patented a process for using lime to recover manganese from the manganese chloride formed as a by-

[20] Clow and Clow, *op. cit.*, pp. 172-198.
[21] *Ibid.*

product, but the process was not a commercial success. Finally, in the sixties, two processes were invented which solved the joint problem of disposing of the hydrogen chloride produced in the Leblanc process and of preparing inexpensive chlorine.

The Deacon process achieved the oxidation of hydrogen chloride to chlorine and water through the agency of atmospheric oxygen, the hydrogen chloride and air being passed over a copper salt which served as a catalyst. Henri Deacon (1822-76) had had a long experience in chemical manufacture when he made the invention, being the operator of Gaskell, Deacon & Co. of Widnes from 1855 until the time of his death in 1876. The process was successfully used for several decades though encountering severe competition from the Weldon process and from the fact that the Solvay process was supplanting that of Leblanc.

Walter Weldon (1832-85) was an English journalist and inventor who perfected a successful process for recovering manganese from manganese chloride. A solution of the latter was treated with calcium hydroxide to obtain manganese hydroxide and calcium chloride. The mixture was then aerated to convert the manganese hydroxide to dioxide which could then be reused in producing chlorine. The process was widely adopted in Leblanc soda plants and had the effect of significantly lowering the price of bleaching powder. However, the failure of Leblanc plants and the development of the Kellner-Castner process for producing alkali and chlorine led to the ultimate abandonment of both the Deacon and Weldon processes [22].

FERTILIZERS

The new knowledge of chemistry quickly had an effect on agriculture as an understanding was gained of the role of various elements in the growth of plants. This interest had been developing in agricultural circles during the 18th Century, especially in Britain. In France, Lavoisier had carried out scientific experiments on his estate near Fréchines. When Humphrey Davy (1778-1829) was appointed to the Royal Institution, one of his assignments was to investigate the application of chemistry to agriculture. This led to a lecture series and the book, *Elements of Agricultural Chemistry* (1813). The subsequent activities of Lawes and Gilbert, Thaer, J.F.W. Johnston, Boussingault, and Liebig, did much to extend the understanding of soil treatment in relation to plant growth. At first additions to the soil were chiefly in the form of manure and

[22] MIALL, *op. cit.*, pp. 7-11.

natural minerals like lime, marl, gypsum, potash and saltpeter—substances which had been in some use since ancient times. Then, toward midcentury, there was an extension into new areas [23].

Justus Liebig (1803-73), at the University of Giessen, in Germany, took a position of leadership in advocating the restoration to the soil of those elements removed in large quantities by growing crops. The need for phosphorus received particular attention. Bone was known to be a rich source of phosphorus, but gave indifferent results when applied to the soil. Experiments by John Bennet Lawes (1814-1900) on his estate at Rothamsted, in Hertfordshire, revealed that bones became good sources of phosphorus after treatment with sulfuric acid, a suggestion originally made by Liebig. Lawes patented the process in 1842 and built an establishment near London for producing phosphate fertilizer during the next year. A year later, manufacture was begun by a Dr. Richardson in northern England. Sources of phosphate at first were bones, bone-ash, and animal charcoal waste from sugar refineries. Soon mineral phosphates came into use for fertilizer production. Deposits of apatite (a calcium fluorophosphate) were worked in the United States and North Africa. Later in the century, slag from the Thomas-Gilchrist process for steel production added to the supply of agricultural phosphates.

The importance of nitrogen and potassium began to be recognized about the same time. Liebig was of the opinion that plants obtained their nitrogen from ammonia present in the air and misled agriculturists for a time, but his stress on the importance of potassium was of major importance. Potassiums salts had been and continued to be applied in the form of wood ashes, potash, and saltpeter. The first major source of potassium salts became available with the working of the salt deposits at Stassfurt. Methods were gradually developed for the crystallization of the salts from one another and Germany became the world's supplier of potassium compounds and fertilizers [24].

Guano from the islands off the coast of Peru began to be shipped to Europe for fertilizer, in 1835. The sodium nitrate deposits of the Chilean desert began to be worked at about the same time. The nitrate found use in several quarters since it not only provided a nitrogenous fertilizer, but served as a source for nitric acid, thus supplanting precious saltpeter which had been used for that purpose [25].

[23] CLOW and CLOW, *op. cit.*, pp. 456-514; HAYNES, *op. cit.*, pp. 335-340; A. J. IHDE, "Edmund Ruffin, Soil Chemist of the Old South", *J. Chem. Educ.*, 29 (1952), pp. 407-414.

[24] FINDLAY, *op. cit.*, pp. 268-269.

[25] DONALD, *op. cit.*; HAYNES, *op. cit.*, pp. 340-343.

EXPLOSIVES

Black gunpowder remained the only explosive of any importance until the middle of the 19th Century, when new chemical explosives began to be discovered. The production of black gunpowder from saltpeter, sulfur and charcoal changed little through the centuries. It was quite apt to be of uncertain quality since the three ingredients varied a great deal in quality and proportion. A major improvement was noted only after Antoine Lavoisier undertook an investigation of saltpeter upon being appointed to the Gunpowder Commission, in 1775. He was able, as the result of his systematic studies, to standardize the production of saltpeter so as to be certain of a salt of uniformly high quality. It has been said that a large part of the success of Napoleon's artillery may be attributed to the superior quality of French gunpowder resulting from the research of Lavoisier.

Gunpowder continued to be produced in small establishments in most parts of the world. In some countries, it was a government monopoly. In America, the Dupont family, members of which had at one time been associated with Lavoisier, took up the manufacture, prospered during the War of 1812, and became a major American producer thereafter [26].

When concentrated nitric and sulfuric acids react with cotton, there is an introduction of nitrate groups into the molecule of the fiber. If the nitration is extensive, the product is known as "guncotton" ; if partial, as "pyroxylin" or "nitrocellulose". The French chemist, Théophile Jules Pelouze (1807-67) discovered the violently inflammable nature of the product resulting from the treatment of cellulose with nitric acid ; but it was Christian Friedrich Schönbein (1799-1868), Professor of Chemistry at Basel, who discovered its highly explosive character and introduced sulfuric acid into the preparation to improve the nitration. When detonated with fulminate of mercury, first prepared by E.C. Howard in 1799, guncotton exploded sharply with the evolution of a large volume of gases. Schönbein's efforts toward commercial production in England failed following serious explosions in which workmen's lives were lost. The product was not brought into commercial production until after 1886 when the French physicist, Paul Vielle (1854-1934) of the Ecole Polytechnique, succeeded in preparing a gelatinized, horn-like explosive composed of pyroxylin and guncotton in ether and alcohol. It burned smoothly under conditions which made it suitable for use as a propellant. Since only gaseous products were formed on explosion, it was a smokeless gunpowder, which replaced black gunpowder for military operations following the Spanish-American War.

[26] HAYNES, *op. cit.*, pp. 204-205, 366.

Another important explosive, glyceryl nitrate (nitroglycerine), was obtained in 1846 by Ascanio Sobrero (1812-88), of Italy, when glycerol was treated with nitric acid. The Swedish engineer, Alfred Nobel (1833-96), began commercial manufacture in 1862, but his efforts were repeatedly frustrated because of the sensitivity of the substance to shock. In 1866, he found that the hazard could be greatly reduced if the explosive were absorbed on kieselguhr, a silicaceous earth. The following year, this explosive began to be marketed in stick form as "dynamite". It was possible to transport and handle it with comparative safety since explosion was initiated by a detonator.

Blasting gelatin, a mixture of pyroxylin and nitroglycerine, was introduced by Nobel in 1875. Variants of this product were produced by adding such materials as saltpeter, sodium nitrate, ammonium nitrate, and wood powder. Dynamite and the various forms of blasting gelatin were important factors in the railroad building, tunneling, canal building and mining operations which took place in the last decades of the 19th Century.

Nitrated aromatic compounds were also found to be explosive, picric acid and trinitrotoluene (T.N.T.) becoming the most important. Picric acid, produced by the nitration of phenol, was introduced into military explosives in France in 1885 where it became known as "mélinite". A somewhat similar product was known as "lyddite" in Britain. These preparations were liquified for filling shells which exploded with great violence. T.N.T. did not become important as a military high explosive until World War I [27].

ILLUMINATING GAS

The fact that inflammable gases are driven from coal by heating in the absence of air was known in the 17th Century. While thought was given to the use of such gas, it was not until the end of the 18th Century that practical success began to be achieved. A lecture theater in Louvain was lighted with coal gas in 1785. A hall in Britain was similarly lighted two years later. The latter event was the result of experiments by Archibald Cochrane, the ninth Earl of Dundonald (1749-1831), who had obtained from Parliament, in 1785, an act giving him sole propriety in the use of coal gas in Britain.

Foremost figures in the promotion of coal gas for large scale illumination purposes were William Murdock (1754-1839) in England, and

[27] FINDLAY, *op. cit.*, pp. 270-271.

Philippe Lebon (1769-1804) in France. Lebon lighted a house in Paris in 1801, after experimental work covering ten years. Murdock, an employee of Boulton and Watt, had also been experimenting with house lighting. In 1802 he introduced gas illumination in the Boulton factory in Birmingham. The success of this venture led to the increased use of gas in factory illumination.

A German, F.A. Winzer, or Winsor, became interested in the experiments of Lebon and, when he found no support in Germany, went to England to promote the use of coal gas for illuminating purposes. He was responsible for the lighting of part of Pall Mall in 1807. Three years later, Parliament acted to permit the formation of a distributing company, and the London and Westminster Chartered Gas Light and Coke Co. received a royal charter in 1812. From this time, the use of coal gas spread rapidly in Britain, France, and elsewhere. The lighting of such large cities as London and Paris made evening travel distinctly less hazardous than heretofore.

The large scale use of coal gas for illumination created numerous practical problems which were difficult of solution. Samuel Clegg and John Malam were particularly active in overcoming engineering problems. Clegg also introduced the use of lime to remove undesirable constituents like hydrogen sulfide from the gas. Hydrogen sulfide not only gave the gas a foul odor, but burned to sulfur dioxide, leaving the atmosphere contaminated with a choking gas. Near midcentury it was learned that iron oxides were useful in removing the hydrogen sulfide. The iron sulfide formed could be reoxidized to iron oxide with elemental sulfur as a byproduct. In this way, the iron oxide was reused until the sulfur content became quite high, whereupon the mass was used for sulfuric acid manufacture [28].

Frederic Accum (1769-1838) and his partner, Alexander Garden, were responsible for an understanding of the chemical nature of coal gas. Accum was a German who came to London in 1793 as an apothecary assistant. In 1800, he set up a laboratory in London where he gave instruction in chemistry in addition to activities as a consultant, author, lecturer, and supplier of apparatus and chemicals. He figured prominently in the gas industry, contributing to the chemical understanding of illuminating gas and writing a book on gas lighting, besides being a director of the gas light company in London [29].

Coal gas was composed primarily of hydrogen and methane, with some carbon monoxide and small amounts of unsaturated hydrocarbons, nitrogen, and miscellaneous components [30]. The principal gases burn

[28] MIALL, *op. cit.*, pp. 187-190 ; CLOW and CLOW, *op. cit.*, pp. 389-423.
[29] Charles A. BROWNE, "The Life and Chemical Services of Frederick Accum", *J. Chem. Educ.*, 2 (1925), pp. 1008-1017.
[30] MORGAN and PRATT, *op. cit.*, p. 208.

with much heat and a nearly colorless flame. The light is caused by traces of hydrocarbons whose combustion is incomplete. Such compounds were sometimes added to enhance the illuminating qualities of the gas. Toward the end of the nineteenth century, heating mantles became sufficiently satisfactory to cause their general adoption, thus permitting a change in the gas. Luminous substances were completely ...oved and reliance was placed on the heating value of the gas to raise th ...antles to incandescence.

Humphrey Davy, in 1816, suggested that the luminosity ... flames was caused by white-hot solid particles. Various persons noted ... lime, thoria, and other solids incandesced when heated in hot flames, but little practical application was made of the observation until the eighties. At that time, Carl Auer (later Baron Auer von Welsbach, 1858-1929), of Austria, perfected a gas mantle consisting of threads of ramie or cotton impregnated with the nitrates of thorium and cerium and traces of other metals. Upon ignition, organic matter was burned off and nitrates were converted to oxides which incandesced at the temperature of the gas flame. From this time forward, gas manufacturers concentrated on the heating value of their product and the user depended on mantles for illumination [31].

Water gas, or blau gas, came on the market in the last quarter of the 19th century. It had been known late in the 18th century that injection of steam into hot coke gave an inflammable gas. Early attempts to commercialize the production of the gas were unsuccessful. Finally, around 1875, Thaddeus S. Lowe (1832-1913), an American aeronaut and inventor, succeeded in developing an intermittent process for subjecting hot coke alternately to the action of steam and air. A French immigrant to America, Tessie du Motay, was active in developing water gas at the same time [32].

The gas is a mixture of carbon monoxide and hydrogen, is rich in heating value, burns with a non-luminous flame, and is highly toxic. It was used directly as a fuel, or diluted with coal gas. Later on, it became important as a source of industrial hydrogen, the carbon monoxide being converted to dioxide by catalytic oxidation with steam, following which the carbon dioxide could be separated from the hydrogen.

Other fuel gases were also developed from coal and coke. Producer gas is the name given to the gas prepared by passing a limited quantity

[31] M. E. Weeks, *Discovery of the Elements*, 5th ed. (Easton, Pa., 1945), pp. 428-430; Miall, *op. cit.*, pp. 190-194.

[32] John H. Wolfe, "Important Points in the Development of the Manufactured Gas Industry with Particular Regard to the Influence of Chemical Research", *J. Chem. Educ.*, 6 (1929), p. 740; Channing W. Wilson, "Foundation and Development of the Gas Industry in America", *ibid.*, 18 (1941), p. 104.

of air through a bed of hot coke or coal. Sometimes steam was also introduced into the gas producer. The resulting gas, low in fuel value but easily and cheaply produced, was a valuable industrial fuel. It was usually produced for use in industrial furnaces requiring gas for convenience and cleanliness as, for example, the Siemens' regenerative furnace for producing open hearth steel, glass and phosphorus.

Fuel gas was also produced by the cracking of petroleum or tar. It was similar to the coal gas in composition, though usually richer in unsaturated hydrocarbons which imparted luminosity to the flame. Such oil gas was often mixed with coal or water gas when high luminosity was desired.

English blast furnace gas was investigated by Robert Bunsen (1811-99) and Lyon Playfair (1818-98) in 1844-45, and found to have considerable fuel value. It was dirty and unsuitable for many purposes, but gradually came into use as a fuel for heating air going into blast furnaces [33].

Natural gas, occurring ready formed in the earth, was not much used before the present century, although gas wells were frequently encountered in Russia and America.

SYNTHETIC DYES

The coal tar dye industry developed out of an accident in which William Henry Perkin (1838-1907), while still a student at the Royal College of Chemistry in London, in 1856, failed in his objective of synthesizing quinine, but obtained a colored product which was found to have dyeing qualities. He immediately undertook commercial production, coping with problems raised by lack of suitable equipment, processing methods, and raw materials, to achieve financial success. He developed the commercial production of aniline from benzene, an important constituent of coal tar. Tar had been considered a nuisance product by the coke and gas industry and much of it was wasted. Some was distilled to obtain spirits for use in varnish manufacture and as a rubber solvent in the production of Mackintosh raincoats.

Creosote, another coal tar derivative, was used as a wood preservative. Benzene was not produced commercially until Perkin was able to induce a Glasgow firm to distill it from coal tar. The new dye was used by a few British dyers but did not prove popular until it became fashionable in

[33] MIALL, *op. cit.*, pp. 195-197.

France under the name "mauve". Perkin's patent was declared invalid in France and manufacture began there almost at once [34].

The success of mauve stimulated much investigation toward the discovery of additional colors of commercial value. Aniline and related compounds, like quinoline and toluidine, were investigated for their ability to form colored derivatives and a whole group of new dyes were synthesized, compounds like Magenta, Imperial Blue, Quinolene Blue, and Bismark Brown. Dye plants were opened in Manchester, Lyons, Ludwigshafen, and elsewhere. Peter Griess (1829-88), who came to London to study with Hofmann in 1858, had discovered the azo group two years earlier. The azo group itself had no dye properties, but compounds containing the group readily linked with coal tar products to give useful dyes.

August Wilhelm von Hofmann (1818-92), who had been one of Liebig's students before becoming director of the Royal College, carried out research on the fundamental chemistry of organic nitrogen compounds, and was responsible for the training of many chemists who became important in the dye industry ; men like Perkin, Griess, Caro, Martius, Witt, Nicholson, and Medlock. All of these men figured in the British dye industry, but the Germans among them soon returned to their native land where they took part in the rise of the German industry.

By 1869, a number of new dyes were in production in Britain, Germany, France and Switzerland. In that year, Perkin and Caro independently arrived at a method for the synthesis of alizarin, the coloring material derived from the root of the madder plant since antiquity. Synthesis began almost at once in Germany and England. In Perkin's case, production was under a patent arrangement with the Germans since he had been anticipated by Caro in obtaining an English patent by exactly one day. Alizarin synthesis created a demand for anthraquinone, produced from coal tar, which was met only after some difficulty. Synthetic production of alizarin resulted in a tremendous increase in the use of the red dye with the simultaneous destruction of the madder growing agriculture of southern France [35].

During the next decade, the dyestuffs industry became an almost complete monopoly of German firms, with the *Badische Anilin und Soda Fabrik* in the dominant position. English manufacturers found the competition too severe and dropped out of contention except for the firm of Ivan Levinstein. Levinstein was born and educated in Germany, but began the manufacture of synthetic dyestuffs in Manchester in 1864. He persisted tenaciously in keeping his business going in the face of severe

[34] MIALL, *op. cit.*, pp. 70-73.

[35] L. F. FIESER, "The Discovery of Synthetic Alizarin", *J. Chem. Educ.*, 7 (1930), pp. 2609-2633.

German competition while similar firms in England and elsewhere succumbed. Perkin sold his company in 1874.

A number of factors were responsible for the world dominance of German chemistry during the half century preceding World War I. Perhaps most significant was the conscious governmental encouragement of German chemical education and chemical industry following unification of the German states and the chancellorship of Bismark. Science was well taught in the German universities and industrial research laboratories were well financed. Not only chemists, but chemical engineers were trained for industry. Protective tariffs prevented foreign dyestuffs from entering Germany while Britain's traditional free trade position enabled the German industry to sell there in competition with British dyestuffs. German patent laws were also favorable to the promotion of domestic industry in contrast to British laws which permitted foreigners to take out patents without working the process in England. German sales efforts were vigorous and included technical sales officers who could teach prospective buyers how to use their products.

The government encouraged both basic and applied research. Large sums of money and years of research went into the commercial synthesis of indigo, production of which began in 1897 and demolished Indian indigo farming much as the synthesis of alizarin had ruined madder farming a quarter century earlier. Indigo synthesis had been accomplished in the laboratory by Bayer by 1880, but seventeen years of development were needed to make the synthesis commercially practical[38].

OTHER ORGANIC CHEMICALS

With the development of a dyestuffs industry, it was natural that the manufacture of related chemicals should also develop. The same substances which could be converted into dyestuffs were also useful in preparing a great variety of organic chemicals. Uses were sought for such substances, especially in medicine. The development of the germ theory of disease by Pasteur, with the resulting stimulus to bacteriology and to medical research, saw attention given to compounds which might have value as drugs. Research revealed that certain physiological effects might be expected from certain molecular arrangements. This led to investigations in which molecular structures were altered in various ways in order to obtain desired effects. There was some success in developing fever-

[38] Walter M. GARDNER, *The British Coal-Tar Industry* (London, 1915), *passim*; MIALL, *op. cit.*, pp. 77-89; FINDLAY, *op. cit.*, pp. 129-142.

reducing and pain-killing drugs. Aspirin, for example, was introduced by the Bayer Company after it was learned that acetylation of salicylic acid gave an analgesic and antirheumatic drug which did not cause the gastric upsets of salicylic acid itself. This type of drug, however, attacked the symptoms rather than the cause of the disease.

The introduction of a large variety of synthetic dyes influenced microbiology when it became evident that certain dyes had selective staining effects on particular organisms or tissues. This suggested to Paul Ehrlich (1854-1915) and to others, that the right molecule should have a toxic effect on a particular microorganism without harming the host. With the cooperation of the German dye industry he embarked upon a systematic search for such specifics, being successful in developing arsphenamine for the treatment of syphilis shortly after the twentieth century began. In general, however, the search for chemical specifics was disappointing in its results.

The organic chemical industry was also responsible for the availability of aromatic phenols, quinones and amines used as photographic developers and of dyes sensitive to those portions of the spectrum to which silver halide film was not particularly sensitive. The interest in photography, which was developing in the thirties and forties, was responsible for the growth of a plate and film industry which flourished in Germany. The requirements for bromine for preparation of silver bromide were satisfied by the rich salt deposits at Stassfurt [37].

Synthetic chemistry also produced organic compounds which became important as perfumes, food flavors, and preservatives. Coumarin, used both as a flavor and a perfume, was discovered by Perkin in 1868. Saccharin, an artificial sweeter, was synthesized by the Americans, Ira Remsen (1846-1927) and Constantin Fahlberg, in 1879. Besides these and other synthetic chemicals, various esters and aldehydes, responsible for flavors and odors in natural products were produced synthetically [38].

FOODS

With the urbanization of the population which took place in the 19th Century, food industry took on large proportions and chemistry began to influence food production and distribution, altering the processing of traditional foods and bringing new ones on the market. Commercial

[37] Josef M. EDER, trans. by E. EPSTEAN, *History of Photography* (New York, 1945); Georges POTONNIÉE, *Cent ans de photographie 1839-1939* (Paris, 1940); Beaumont NEWHALL, *The History of Photography* (New York, 1949).

[38] FINDLAY, *op. cit.*, pp. 144-148.

glucose, or corn syrup, prepared from starch by acid hydrolysis, was a case in point. Margarine was another.

The French government offered a prize in 1869 for a process for the production of a substitute for butter. The prize was collected by Hippolyte Mège-Mouriés (1817-1880) for a process based upon the treatment of heated fats, such as suet, with potassium carbonate and pepsin. Upon pressing, the fat was separated into a solid portion, stearin, and a plastic portion known as oleomargarine. This latter portion was churned with milk to obtain a butter-like product [39].

Margarine manufacture spread rapidly to other countries. Production methods quickly abandoned the enzyme treatment of Mège-Mouriés and introduced appropriate fatty oils such as those from coconut and palm. The product, at that time, was nutritionally inferior to butter, since nutrition studies had not yet discovered the existence of vitamins. In addition, margarine was frequently involved in fraudulent sales as butter. Food laws, in the 19th Century, were still in a formation stage, if they existed at all.

Some of these chemical products and chemical operations were of value in diversifying or improving the food supply. Many times they were more apt to be agents of fraud. Butter was adulterated with foreign fats. Syrups were adulterated with commercial glucose. Harmful colors and flavors were used to hide inferiority. Preservatives were used to prevent spoilage of products made of low quality raw materials under unsanitary conditions. Adequate legal control of food manufacture and sale began to appear only toward the end of the century [40].

ELECTROCHEMICAL CELLS

Following the electrical discoveries of Volta in 1799, the electrochemical cell was rapidly utilized as a source of current. On application of current to various solutions, a new understanding of chemical combination was gained and new elements were discovered. Early cells were extremely unstable with respect to voltage, but this defect was overcome in 1836 by John Frederic Daniell (1790-1845), an English scientist.

[39] A. C. J. Andersen, *Margarine* (London, 1954), pp. 1-6 ; H. A. Schuette, "Know your Foods - I : Oleomargarine", *J. Chem. Educ.*, 5 (1928), pp. 1621-1626.

[40] A.W. Blyth and M.W. Blyth, *Foods : their Composition and Analysis*, 6th ed. (London, 1909), pp. 3-46 ; E. H. S. Bailey and Herbert S. Bailey, *Food Products, their Source, Chemistry and Use*, 3rd ed. (Philadelphia, 1928), pp. 499-516 ; H. A. Schuette, "Death in the Pot", *Trans. Wisconsin Acad. Sciences, Arts and Letters*, 35 (1943), pp. 283-303.

Daniell's cell utilized zinc and copper electrodes placed in solutions of their respective sulfates, the solutions being separated by a porous diaphram. This cell and variants thereof came into extensive use in telegraphy, electroplating, driving primitive motors and research.

Other useful cells were developed by William R. Grove (1811-96) in England, Robert Bunsen (1811-99) in Germany, and Georges Leclanché (1839-82) in France. The latter, in 1867, employed a zinc electrode in ammonium chloride solution with a carbon electrode surrounded by manganese dioxide as a depolarizer. The cell proved to be an extremely useful one at a time when industrial demands were rising. A subsequent modification resulted in the "dry cell", developed by a Dr. Gassner in 1888. It substituted moist ammonium chloride for the solution in the Leclanché cell, and utilized the zinc electrode as a container, thus providing a convenient, portable, and relatively inexpensive source of current.

Experiments toward the development of accumulators or storage cells were proceeding at the same time. Gaston Planté (1834-89) invented such a cell in 1859, using lead sheets in sulfuric acid solution. A charge could be developed in the cell by a tedious "forming" process, but the difficulty of preparation prevented it from being accepted. Two decades later, by which time the electrical generator had become a practical device, the problem of storage cells was explored again by a number of investigators. Camille A. Faure, in 1881, simplified the "forming "process through the use of oxides of lead on lead plates. Perforated plates and grids giving better adherence to the electrode material were introduced by Volckman, Swan and Correns, but the cell continued to offer practical difficulties which remained unsolved until the stimulus of the automobile, in the next century, led to intensification of research [41].

ELECTROCHEMICAL INDUSTRIES

Utilization of electrical energy for carrying out chemical changes was under study from the time the voltaic cell became available, but it was only at the end of the 19th Century that a real electrochemical industry developed. As long as current sources were dependent on electrochemical cells, only small operations like silverplating were practical. After the development of practical generators, around 1870, electricity became more generally available. Where there were large installations,

[41] G.W. VINAL, *Primary Batteries* (New York, 1950), pp. 1-24.

as at Niagara Falls in the United States, the price of electrical energy was sufficiently low to encourage large scale development of electrochemical processes as the century came to a close. Production of sodium hydroxide and chlorine has been mentioned above. Nickel plating and plating with other non-precious metals became popular at the century's end. Sodium and bromine were two elements produced electrochemically for use in preparing special chemicals [42].

Electrothermal products were also developed at this time. The electric furnace in its various forms became practical with the abundant supply of electricity and was utilized in the production of such substances as calcium carbide, cyanamide, artificial graphite, and silicon carbide. The latter was discovered by the American Edward G. Acheson (1859-1931), in 1891. He recognized its possibilities as an abrasive and began marketing it as "Carborundum". He also developed artificial graphite for use as an electric conductor [43].

Calcium carbide was discovered in 1892 by Henry Moissan (1852-1907), of France, when he heated a mixture of lime and carbon in the electric furnace developed by him. It was independently discovered by Thomas L. Willson (1860-1915), a Canadian. Calcium carbide reacts with water to give acetylene gas which burns with a luminous flame. The gas never became popular as an illuminant, as some promoters had hoped, though calcium carbide lamps proved useful on bicycles and early automobiles, Acetylene gas proved most useful when burned in a suitable torch with oxygen, and used for cutting and welding metals. Later, in the 20th Century, the gas became important in organic chemical synthesis [44].

In 1898, the German chemist F. Rothe discovered that cyanamide was obtained when nitrogen was passed over hot calcium carbide. Cyanamide proved to have some value as a fertilizer and gave ammonia when treated with steam. The cyanamide process for fixing nitrogen was studied very seriously in the early decades of the 20th Century but was found wanting in competition with the Haber-Bosch process for synthesizing ammonia from hydrogen and nitrogen [45].

[42] E. Farber, *Evolution of Chemistry* (New York, 1952), pp. 285-286.

[43] Edward G. Acheson, *A Pathfinder. Discovery Invention Industry* (New York, 1910), pp. 97-115; H. C. Cooper, "Modern Abrasives", *J. Chem. Educ.*, 19 (1942), p. 123; F. J. Tone, "Abrasives", in *Chemistry in Industry*, H. E. Howe (ed.), (New York, 1924), Vol. I, pp. 21-23.

[44] C. J. S. Warrington and R.V.V. Nicholls, *A History of Chemistry in Canada* (New York, 1949), pp. 166-169.

[45] Harry A. Curtis, *Nitrogen Fixation* (New York, 1932), pp. 77-89.

MISCELLANEOUS

As the 19th Century drew to a close, chemistry was influencing industry in many other ways. The paint industry benefitted during the century from the introduction of new pigments like lead chromate, ultramarine, zinc oxide, and lithopone (zinc sulfide and barium sulfate).

Some not-very-practical forms of chemical fire-making devices were being developed at the beginning of the 19th Century, but it was only after 1831 that a moderately reliable match became available. At that time, a French student, Charles Sauria, was able to utilize white phosphorus, sulfur, antimony sulfide, potassium chlorate, and gum for the head of a friction match. No patent was obtained and manufacture was initiated in Vienna, Darmstadt, and elsewhere. For twenty years, those matches were the only type produced despite the fact that phosphorus is highly inflammable, besides being the cause of a disease causing decay of the jawbone in factory workers. Despite its shortcomings, the white phosphorus match continued to be produced into the 20th Century when it was legally driven out of existence following the discovery, in 1898, that non-toxic phosphorus sesquisulfide could replace white phosphorus in the strike-anywhere match. In 1845, the non-toxic and less inflammable red phosphorus was discovered by Anton Schrötter of Vienna. Its use in matches followed its production by the firm of Albright and Wilson, the principal phosphorus producers in Europe after 1851. Red phosphorus was particularly important in the development of the Swedish or safety match by the Lundström brothers [46].

The paper industry turned to chemistry around midcentury when demands for paper were rising and rag supplies were inadequate. Wood, esparto grass, and other plant materials were rich in cellulose, but badly contaminated with substances like lignin which prevented the isolation of the cellulose for the production of good quality paper. Sodium hydroxide, sodium sulfate, and calcium bisulfite were all found to be effective in the purification of wood cellulose and were effectively employed before the end of the century for producing certain types of paper [47].

Cellulose also came to serve as raw material for chemical production. Nitrocellulose dissolves in an ether-alcohol mixture to give a viscous solution known as collodion. On evaporation of the solvent a transparent film of nitrocellulose remains. Collodion had been in use for several decades in medicine and photography when Hilaire de Chardonnet

[46] Richard E. Threlfall, *The Story of 100 Years of Phosphorus Making* (Oldbury, Engl., 1951), pp. 60-64, 245, 361-364 ; Miall, *op. cit.*, p. 248.

[47] William Haynes, *Cellulose, the Chemical that Grows* (New York, 1953), pp. 17-19, 30-41 ; Findlay, *Chemistry in the Service of Man*, 7th ed. (London, 1947) ; Morgan and Pratt, *op. cit.*, pp. 195-196.

(1839-1924) patented a process for making filaments from it by extrusion. A year earlier, in 1883, Joseph W. Swan (1828-1914) had patented a process for making nitrocellulose fibers for lamp filaments. After Chardonnet learned how to eliminate the great inflammability of his fibers by hydrolyzing the nitrate to cellulose, he began marketing "artificial silk" in 1891. Other cellulose derivatives, like cellulose acetate and viscose, were known about this same time, but did not become commercially successful until the next century [48].

Nitrocellulose was also the basis for the first synthetic plastics. Alexander Parkes (1813-90), in 1865, found that nitrocellulose mixed with alcohol and camphor gave a hard mass which could be moulded under pressure when warm. The product was marketed as "xylonite" in England. The same type of product, marketed as "celluloid", was developed in the United States by John Hyatt (1837-1920). It was extensively used for photographic films and for various small articles [49].

Rubber had only a limited usefulness before vulcanization with sulfur and heat was discovered by Charles Goodyear (1800-60) in America in 1839. It rapidly became popular for such uses as overshoes and electrical insulation. The pneumatic tire was developed in 1888 at a time when the bicycle was becoming popular [50].

These and numerous other developments which cannot be discussed further were a part of the vigorously expanding chemical industry at the end of the century. The industry was still in its early expansion stages. The production of common acids, alkalies, and salts, was now well stabilized but was still easily capable of responding to new techniques and sources of supply. Specialty chemicals were very much a German monopoly, but there was sufficient industrial strength in other parts of the Western World to respond successfully to the loss of German supplies at the onset of the first World War.

[48] HAYNES, *ibid.*, passim ; FINDLAY, *Chemistry in the Service of Man*, p. 143-151 ; MORGAN and PRATT, *op. cit.*, p. 196 ; MIALL, *op. cit.*, pp. 151-168.

[49] Carleton ELLIS, *The Chemistry of Synthetic Resins*, 2nd ed. (New York, 1935) ; MIALL, *op. cit.*, pp. 153-154.

[50] P. SCHIDROWITZ and T. R. DAWSON, edn., *History of the Rubber Industry* (Cambridge, 1952) ; W. C. GEER, *The Reign of Rubber* (New York, 1922) ; J. C. LAWRENCE, "Pioneers in the Commercial Development of Rubber", *J. Chem. Educ.*, 7 (1930), p. 1788.

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FISHERY DEVELOPMENTS IN THE 20th CENTURY *

Introduction

MILLIONS of fishermen living along the shores of our vast oceans would hardly agree, if they were asked, that the sea is free with its riches. Often it is more foe than friend, hiding its wealth behind obstacles. Many fishermen would even hint that there has not been much development over the last fifty years or so. It is not far from correct to say that the 20th century has brought improvement in the lot of only a part of the world's fishermen. The great majority of them exploit the natural resources in much the same manner as did their forefathers. They do not realize the potentialities of their industry and many have not the opportunity to expand for they have neither incentives, nor outlets, nor the proper means of exploitation.

As a result, all over the world fishermen have come to be looked upon as poor and ignorant. Yet the present situation bears promises of a more effective utilization of the world's natural aquatic resources for the mutual benefit of consumers as well as producers. Developments in the countries which have made most progress clearly indicate that more may be produced with less human effort. And after we entered the second half of the 20th century the sense of fisheries science and of motorization has apparently spread rapidly to most parts of the world.

Fishing and fish processing are indeed very old industries but it is only partly true to say that they are old-fashioned. In some respects they are modern especially if seen in relation to the general economic setting of maritime states. True, just as no one can pull himself up by his own shoestring, so no country can be expected to have developed a fishing industry beyond its general economic and technical level.

* Recommended by Dr. C. WARE, Author-Editor, Vol. VI.

When patching together the story of fisheries development in the 20th century from bits and pieces, we discern a spectacular development in a number of countries where the economic and social climate has been favourable to changes. Our knowledge of the resources has increased with improved methods of research. Mechanization and motorization in shipping, land transport, and food processing have also been adjusted to fisheries and, conversely, developments in fisheries have given impulses to workers in other fields. But one general feature in the fishing industries of the world has not altered : Fishing continues to be one of the most hazardous occupations in which man engages.

It may be roughly estimated that the total world catch of fish has more than doubled since the turn of the century. This is hardly more than could be expected, for in the same period the population of the world has increased by ninety per cent so that thirty million tons at present actually means no more per head than fifteen million tons meant then. Still, at the turn of the century there was every reason to believe that the advancing motorization and the promising developments in science would lead to a very great increase in the per capita supply. This has not materialized. For developments have indeed been spectacular but they have been confined to a few countries, and progress has been retarded by two world-wide wars.

While it is now commonly recognized that the sea is no longer inexhaustible when exposed to modern means of exploitation, there is no doubt a wide range of possibilities for further increase provided the resources are wisely handled. Moreover, the value of fish as food has been better appreciated so that in turn consumption might well be enhanced ; and a fishing population is now recognized as an asset in itself to a seafaring nation.

I. *NATURE*

The able naturalists who were engaged in fishery research about the turn of the century were filled with admiration of the sea and its secrets, of which so much was then about to be revealed, and they were thrilled with the task confronting them. They were not starting from scratch, for the great scientists of the 19th century had described individual species that were commercially important, their characteristics and their habits. They had traced life at great depths, as has for instance the now classical "Challenger" expedition ; they had also pointed at methods for evaluating the productivity of the sea, indicated the avenue to be followed in managing fresh-water fisheries, and had related hydrographical and biological studies to the yield of fishing. The possibility of forecasting fluctuations in fisheries, and thus of exploiting

them more rationally, had been pointed out. A study of the water masses of the ocean, their chemical and physical characteristics, had begun.

At the preparatory meeting of the International Council for the Exploration of the Sea (ICES), held in 1899 in Stockholm, Sweden, the hope was even expressed that such joint activities in marine research might contribute in some measure to and ameliorate international relations ; for, as one of the delegates put it, seas and mountains no longer fortuitously made enemies of nations who would otherwise be friendly and co-operative.

The seven countries represented at this meeting wished to join in studying the seas, especially in relation to fisheries : the yield of the fisheries, the biology of the various species of fish and of whales, and their environment—the ocean and its productivity, i.e. the assimilation process of the minute plants known as phyto-plankton (the "wanderers"), their geography and magnitude.

The founders of the ICES felt the need for intensified and joint research into problems of common interest. They wanted to standardize methods and, thanks to the experience gained from the over-fished North Sea, they were agreed that some form of international regulation of the fisheries was in the interest of mankind.

With respect to the latter, the two wars showed conclusively that fishing in the North Sea ought to be restricted ; for during the cessation of fishing there in the periods 1914-18 and 1939-45—when the North Sea became a "fish sanctuary", as it were—the fish grew to a much larger size, and the fishery which took place immediately after this "natural" protection brought better catches.

During the inter-war period, the work of the pioneers from the turn of the century gained recognition and was improved upon. The possibility of the stock being over-exploited had long been hinted at by fishermen and others, and in many countries laws had been passed and regulations made to prevent it. But the new thing is the realization that such regulations should be based on scientific evidence and, above all, be made in co-operation with other nations exploiting the same resources. In the North East Pacific the now famous quantitative regulations governing the halibut fishery came into force in the late 1920s. Many clear cases of over-fishing are on record. Because of the absence of regulations the halibut fishery off Greenland came to an end in the early 1930s ; the stock diminished so much that the fishery was no longer profitable. In Japan the production of flat-fish in coastal waters had trended down and there have also been other signs of over-fishing (2)*. In 1937 the nations concerned in the North Sea fisheries jointly imposed certain restrictions on it, although sometimes lackadaisically and with insuffi-

* These numbers refer to works listed in the bibliography, pp. 1007-1008.

cient effect. This was in turn succeeded by the 1946 Convention for the Regulation of Meshes of Fishing Nets and the Size Limits of Fish. The Convention came into force in 1954 and stands a good chance of being successful. Similarly the International Whaling Commission which has operated throughout the post-war period proved fairly successful, if not in preventing, then at least in delaying, the extermination of whales in the Antarctic.

We may perhaps doubt (16) whether the founders of the ICES would be altogether pleased with the progress made and the results achieved by mid-century, for they expected so much. We can be fairly certain however, that they would have approved of the evidence that was presented at the United Nations International Technical Conference on the Conservation of the Living Resources of the Sea and also of the objectives of fishery conservation as set out thus : "Conservation is essential in the development of a rational exploitation of the living resources of the sea. The principal objective of conservation ... is to obtain the optimum sustainable yield so as to secure a maximum supply of food and other marine products..." (37). No doubt there are many who would join Graham (17) in saying that there has been a change of attitude about the beginning of the second half of our century. Short-sighted materialism seems to be yielding before a bright and ample humanism in which the deeper needs of mankind will be attended to.

Intelligent conservation of fish stocks is only possible when it is based on solid evidence. It is therefore only fair to say that it was not until the 20th century that realistic work on conservation was made possible by achievements in the marine sciences. Research methods were effectively standardized and prodigious studies of the water masses and of their effect on the fisheries were thus facilitated. An idea of the ability attained can be gained from an acquaintance with the work carried out by Norwegian scientists. Greatly assisted by Sonar Sounder (the ASDIC), they were able to show that when the borders of the Atlantic and polar waters shifted, the herring did likewise. This helped them in describing the year-round movements of the Arctic herring shoals and had an almost immediate effect in the North Atlantic. European scientists showed that similar factors determine the occurrence of cod in Arctic waters.

It was known relatively early that the age of a fish, like that of a tree, can be determined by counting of year-rings. These appear on the scales, and on the ear-stones (the otoliths). Now, this method was made applicable to herring and cod. These species are of the greatest commercial importance in Europe as they account for some 45 per cent of the total European catch. Connected with these achievements were the studies of fluctuations. Scientists now described them, underlined their industrial impacts and pointed out that the success or failure of most

broods of most species of fish is determined very early in their lives and that the chances of survival of the young fish vary greatly from year to year. This agreed very well with the experience of fishermen ; they were used to quantitative ups and downs although the reason for them had remained a great mystery. These discoveries enabled scientists in some measure to predict the yield of many fisheries. They joined the fishermen and carried out their studies onboard their boats. The most successful, specialized research vessels, the number of which has increased rapidly, were built on the pattern of modern fishing vessels.

Gradually marine research developed. It proved a good support for the rapidly increasing fishing industries ; in some cases it also gathered so reliable information about the fish stocks and their environment that the fishermen could be directed to new grounds. Marine research workers adopted modern means for fish detection and experimental gear on new grounds. Thus a Norwegian scientist in the Lofotens in Norway, discovered cod shoals on the echo-sounder in 1935 (30). Originally the echo-sounder was developed—after years of research—to improve safety at sea and was first used in the late 1920s. Although the results of echo-sounding in the Lofotens were not immediately accepted by the fishermen as a guidance toward a more stable fishery, their significance was fairly soon grasped by the mill operatives, and ten years later the State echo-sounding service with regular announcements on the whereabouts of cod schools was established. (This service has now been superseded by the installation of echo-sounders in a great number of fishing craft in this region ; this change was much accelerated by greater profits caused by socio-economic factors beyond the control of fishermen.) Oceanographic research—"the soil science of the fisheries"—provided environmental factors ; this rendered it possible to make predictions as to space as well ; for hydrographical conditions directly determine the wherabouts of the fish. Also, by opening or closing large feeding areas they determine, directly or indirectly, the living space available to the cod, as has been pointed out by Rollefsen.

The oceanographers too were greatly aided not only by standardization of methods but also by more refined and improved methods and instruments. The famous Northern Seas Expedition had resulted in improved turnable thermometres to measure the sea temperature, and these soon became an integral part of the equipment in all marine research. About 1930 the sea-thermograph, installed on board research vessels and some scheduled liners, came into use for reading and recording temperatures. The water bottles for taking samples of the seawater at various depths were developed and improved. As the years went by, hydrographical research work benefited greatly from the stardardization of methods and terminology. This sort of teamwork became much strengthened and was manifested when in the late 1940s seven fishery

research vessels from seven different nations made simultaneous crossings of the North Sea according to a uniform plan that had been worked out under the ICES auspices. This enterprise gave a spectacular snapshot of environmental conditions.

It is only just to say that the cradle of marine research stood in Europe where the work done by this infant branch of science was really conspicuous ; but we must also pay tribute to research workers in North America who have rendered great services in the modern development of the fishery sciences.

Now, while it is the great quantities of fish which count as food and while we have been right in emphasizing the need for preventing the stocks from being exterminated, it must be realized that aquatic life and the behaviour of aquatic animals still hold many secrets. We have been impressed by the magnitude of the stocks in the post-war years. A fairly complete "theory of fishing" has been worked out. This covers the role played by growth and natural mortality ; it also informs us on how fishing can be combined with conservation of the fish at an economic level. The achievements are such as might easily blind us. The point is that we are justifiably interested in the quantity, and thus in the stocks ; but we do not fully understand their movements, nor can we turn fisheries from the status of a hunting industry into one of modern animal husbandry, until we know more about the individual fish itself, its instincts and behaviour. This perhaps, as pointed out to me by Gunnar Rollefsen, will characterize marine research in the coming decades.

Governments now more and more recognize that effective marine research is conducive to good fishing. The scientists of our age are therefore likely to be better equipped for their task and to stand a better chance of success.

The fishermen themselves look upon conservation as a business proposition. More and more they have come to realize that investment in research serves a useful purpose. In 1920, for instance, when Norwegian weather forecasting was in its infancy, the fishermen themselves financed an extension of the experiments (3). Nowadays regular weather forecasting and gale warning are indispensable to all.

II. *FISH PRODUCTION*

Recent compilation of fishery statistics has helped to make clear the magnitude of the world's fisheries, and the national statistics on fisheries which started in the early part of this century have improved and grown with the industry.

By mid-century some 27 million tons of fish, crustaceans and mollusks and some 2 million tons of whales were produced. By and large this constitutes some 10 per cent of the total supply of animal protein and about 1 per cent of the total calory value of food (12). It is true that these figures are perhaps not so very impressive ; but it must be kept in mind that in Asia fish is more important as food than meat is, and that along the shores of the world it is a dominating item of diet ; it often forms the basis on which the coastal people sustain life.

Of the world production of fish, etc., estimated at some 27 100 000 tons in 1953, 43 per cent was produced in Asia, 27 per cent in Europe, 13 per cent in North America, 2 per cent in South America, 9 per cent in the Soviet Union and 6 per cent in Africa. Only a very small part is produced in Oceania. Also, it is well established that a remarkable proportion—ten per cent or more—of the total production is accounted for by fresh-water fisheries including the hunting for wild stocks of fish in rivers, lakes, ponds and paddy fields, but also by fish culture. This last comprises the stocking and harvesting of ponds, rice paddies and other limited bodies of water. The latter type of fishery, which might best be compared with animal husbandry, is no new thing ; it has old traditions in China, India, Germany and many other countries. But with the growing appreciation of fish as an article of diet, the importance of such production has become more widely recognized, and the work has become systematized and more strongly supported by research. Important work has also been started to introduce fish culture into new areas and to expand it and improve on it where it is already well known.

Measured by the aggregate results of fishing, the large producing countries are easily singled out (11). They are Japan with 4.6 million tons ; China with 3 million tons ; the United States and the Soviet Union with some 2.5 million tons each ; Norway and the United Kingdom with total quantities varying between one and two million tons. We may also count the following five countries among the large producers : Canada, France, Germany, Indonesia and Spain. Their totals range between 0.5 and one million tons in 1953. These eleven big producers together account for more than 18 million tons or nearly 70 per cent of the world total. This increase over the last fifty years can mainly be ascribed to dramatic rises in the production of a few countries within this period, such as in that of Japan, which went up from 1.3 million tons in 1910 to 3.6 million tons in 1938 ; in that of Norway, where production rose from 0.5 million to 1.1 million tons ; in Germany the increase was from 168 000 to 717 000 tons. Other countries where the industry expanded particularly fast in the first decades of our century, are Iceland, Denmark, the Argentine and, most probably, the Soviet Union and the United States. Fairly detailed statistics for the last fifteen years throw light upon the more recent changes in the volume

caught and reflect remarkable progress. Thus, catches in Angola increased from 26 000 tons in 1938 to 222 000 tons in 1953. In French Morocco the increase was from 31 000 to 128 000 tons, in the Union of South Africa from 64 000 to 353 000 tons, in the Philippines from 81 000 to 312 000 tons, in Denmark from 97 000 to 343 000 tons. In South America the total production was doubled during the Second World War. However, while it is true that the development of the fisheries has been instrumental in building up wealth and strength in some of these countries, it hardly caused, but rather resulted from, development in other fields. And yet, as is so clearly illustrated in the case of Iceland whose fisheries are of an overwhelming importance in the economy of the country, it is true that, if properly handled, they are a good basis for a decent living also now. In this particular country fish production increased from 274 000 tons in 1938 to 425 000 tons in 1953.

But now attention must be drawn to the fact that in the important fishery countries—where the industry is also most highly developed—total production has not risen so very much since 1938. For the eleven largest producers taken together, there has been a rise from 16 to 18 million tons or only some 12 per cent. This does not reflect stagnation, rather, it tells us that the changes and the developments have taken place in other fields.

To many countries fishery products are important export items; directly and indirectly they are the means by which essential goods from abroad are obtained. It has been roughly calculated that about one-fourth of the world catch of fish goes into international trade in some form or other.

III. *TECHNIQUE OF FISHING OPERATIONS*

Increases in fish production may often be regarded as a manifestation of technical efficiency, but many factors must be taken into account. Without the expansionary element in the European and the North American economies, the conspicuous development of fishing technique which started about the turn of the century would hardly have taken place. And without the two wars the development would have been more even. It must also be added that, without extensive and even many untapped resources to exploit, fishing could not have been carried out on a profitable basis. In this respect the picture has certainly changed a great deal. It is with good reason that we now emphasize the limitations of fish resources; but at that time the natural pre-conditions for an expansion were there and were used.

France was perhaps the first country to use steam for fishing craft. Her first steam trawler appeared on the fishing grounds in the 1870s. In the main British ports steam trawlers were put to use in the 1880s. As they could operate independently of wind and calms and could fish deeper waters they soon replaced the sailing trawlers. In Grimsby, for instance, there were only 29 left of the latter by 1909, while the number of steam trawlers had increased to more than 600. In Germany, which may also be counted among the pioneers in trawling and distant water fishery, the first steam trawler, financed by the wholesale fish trade, was used in 1885 (27). In 1897 the number passed 100. In 1938 it was 370. Apart from the Japanese, who even established trawling companies in Latin America, no other trawling industry worked more intimately and more successfully at discovering and exploiting new grounds than the German. On the east coast of the United States the first otter trawler was introduced in 1905 and the number increased rapidly. Simultaneously trawling started in Canada.

At about the same time the otter board was developed. This is so designed as to keep open the mouth of the conical trawl net while it is being dragged along the floor of the sea. With the introduction of steam as the chief motive power efficient winches could be used to haul the gear ; thus unexploited haunts were now opened up as fishing became possible at greater depths. Soon bigger ships were built to meet the requirements of "distant water" fishery. Trawling was no longer confined to the North Sea—the cradle of this particular catching method. The ships went out to the seas around Iceland and Norway and to the Newfoundland and Greenland fishing grounds. This development has continued up to the present day and is now greatly favoured by improved types of trawl, better electronic instruments, such as radar, radio telephone, direction finders and echo-sounders, and other aids to navigation and fishing. Improvements of the trawlers took a rapid upswing after the First World War. By 1930 the speed exceeded 10 knots for the first time. At present more than 12 knots is not uncommon.

The first German trawler went to the Barents Sea in 1905. Now, on the grounds off Iceland and the Norwegian Coast, and along the Murman coast several hundred trawlers of 140-200 feet in length, and coming from the United Kingdom, Germany, the Soviet Union and other countries, meet regularly to exploit prolific resources of cod and related species as long as they are found there in sufficient abundance to yield a profit.

Simultaneously with the development of the otter trawl fishery from European ports, the internal combustion engine began to be put to use in minor fishing craft in the first decade of our century. Gradually it replaced sail and oars in all sorts of European fishing boats and caused an expansion both here, in America and in Japan. As for North Europe

at least, it is true that the process of motorization has now been completed. Also, the postwar period has accelerated the introduction of diesel and diesel electric propulsion in trawlers. Here the traditional steam engine—which now often burns oil instead of coal—is gradually giving way to the more economic diesel propulsion. Even in the cod fishery off Greenland and Newfoundland, where fishermen from France, Portugal and Spain up till quite recently operated with old-fashioned sailing vessels, modern means of propulsion are now being put to use. The trawl itself has been modified and various new models are available. The light trawl net, known as the Danish seine, became very popular in the 1920s in the North Sea area. It has proved effective on small craft and has spread to many countries. Experiments with the object of designing a trawl capable of being dragged between the surface and the bottom have met with success during recent years.

European development soon spread not only to North America but also to other regions. In South Africa the first trawl catches were made in the 1890s and the first trawling company (with two ships) was established in 1903. The first successful otter trawler used for offshore fishing in Japan was built in England and started operations in 1908 (4). The fleet developed rapidly and had 150 units as early as 1912. What is happening now is that the motorization process is spreading far beyond the countries where it started. In the Bombay province in India some 50 engines had been installed by 1950. Now the number has passed 600. Similarly, in Hong Kong, Singapore, Ceylon and Indonesia motorization of the fishing fleet is gaining momentum. Meanwhile the process of improving both craft and engines continues. The problems of boat design have been taken up not only from the naval architecture point of view, but also in relation to the requirements in fishing where many peculiar problems are found ; for fishing operations have requirements of their own. Much effort is being put in to develop fishing boats which are sufficiently stable in rough weather and storm. This will enable fishing to go on and higher speed to be attained in bad weather with as little strain as possible, just as it will, in the end, prove the best economy in propelling the craft. The last twenty years or so have seen a revolution in the design, propulsion and equipment.

One of the best examples of development in fisheries in the wider sense of the word is the use of mother ships in whaling. The first steam ship fitted out as a floating factory ship in whaling was put in commission in 1904. This made it possible to expand whaling into the Antarctic. From a modest start in the early part of the century Antarctic whaling grew at an explosive rate (29) to reach a peak in 1931. While the total catch after that time was restricted by voluntary arrangements within the industry, equipment improved and continues to improve year by year. More catching boats were attached to each

factory ship and from the early 1930s to the early 1950s average engine power was more than doubled.

In fishing, too, mother ships with modern equipment were used, although with varying success. Japanese fishermen explored large parts of the Indo-Pacific region and the North-West Pacific with well-equipped fleets, fishing for the domestic market and for export. In the United States the first factory ship for converting herring into meal and oil was put in operation in the 1920s and led to a considerable development both in the United States and in Norway. Encouraged by increasing demand for canned tuna in America "tuna clippers" went ever farther south to explore the abundant resources of this species in the rich feeding area of the Peruvian current and elsewhere in the Pacific. They are modern boats in every respect with tanks for live bait, with freezing plants for the product and, naturally, the most modern means of navigation. Some of them now even carry airplanes to spot the shoals.

In the fishing of herring and other clupidae the purse seine, originally developed in America, has come to be of great importance. In the hands of able marine scientists and fishermen the increased use of echo ranging equipment has made it easier to locate herring schools.

Mention must now be made of the more "old-fashioned" forms of gear, the beach seine, the cast-net, the gill net, the long line, the pots and traps and snares and the single line and hook. They too are being improved. Man-made fibres are superseding hemp and cotton, whereby the yield is often increased many times, and modern winches are used to haul the gear and the catch, echo-sounders are often used to locate the shoals. Experiments are in progress to determine the best colour to use for nets.

Man has indeed increased his skill in fishing ; but a still greater number of mill operatives must get their share of this skill if the fishery is to achieve the maximum result, and if the world's endeavour to attain a more adequate food supply is to be successful.

Very soon the modern means of fish detection will have developed to such a degree of perfection that a real, detailed mapping of the aquatic resources will become possible. Coupled with ever-increasing efficiency in capturing, this will mean an additional threat to the "wealth of the seas". There are new and perhaps even more revolutionary methods in the offing. The use of electricity in fishing has been given some publicity. This method is still at an embryonic stage. But, as far as we know today, it may become an effective method in the world's fishing effort. Here we are really on the border-line between past and future developments.

IV. *FISH PROCESSING AND DISTRIBUTION*

Often the process of production is only half completed when the fish is landed. To reach the consumer in an acceptable form it has to go through further processing, be transported and pass into retail trade. Generally speaking, we may say that at the time the fish reaches the boundary in export trade its value has doubled, and by the time it is handed out to the consumer its value has at least trebled. But this of course is only a very rough estimate.

Close upon half of the total world production is consumed in a fresh state. In the less developed tropical and semi-tropical areas fresh fish is only used along a narrow fringe of the coast. In more temperate zones transport has improved rapidly with the building of roads and railways into the hinterland. Thus the opening of railroads to the North American West Coast made the eastern markets available to west-coast salmon and caused a large expansion in the fishery ; and the adoption of ice-cooling and other refrigeration had a similar effect. On the other hand it must be borne in mind that fish is now being caught farther away from the consumption centres than ever before, and that with a rising standard of living, stricter demands are made on the quality.

It is now well established that bacteria and other microbes but not so much chemical reactions catalyzed by enzymes are a paramount cause of the spoilage of the fish during the first period after is has been killed. The main aim in the preservation of fresh fish is therefore to reduce the number of microbes and to arrest or delay their growth. Unlike mammalian muscular tissues, the tissue in fish rapidly loses its ability to perform post mortem respiratory reactions, which are a series of those chemical processes that go on in the live muscle. Fish is very perishable in that it starts to deteriorate very soon ; but the lower the temperature, the slower is the deterioration. When fish is kept at a temperature of 0 degrees centigrade (32° F)—which is the ideal for fresh fish—the action of the bacteria, for which fish seems to have so many prerequisites, is slowed down ; but it is not arrested. Deterioration goes on despite the cooling and after a few days the fish must be classified as "old" ; when the fish is, say six days old, signs of deterioration develop. At this stage the fish muscles—initially fresh—have become much changed, not only through bacterial invasion but also through a chemical process (autolysis) that is governed by enzymes. After the sixteenth day it becomes putrid but often it can be used considerably longer without being exactly dangerous.

Ice has been used for centuries to preserve fresh fish, but up till quite recently the effect of cooling was, on the one hand, generally exaggerated and, on the other, not sufficiently appreciated within the limits where it could be used effectively. In the late 1920s, however, intensive research

was started in England and in other countries. For long-distance trawling had made effective transport to such markets as were located far away from the distant fishing grounds of paramount importance. The manufacture of ice has become a big industry ; washing and cleaning has been recognized as essential in our endeavour to reduce the possibilities of bacterial growth. Insulated holds are being more extensively used and the speed of trawlers and transport craft is steadily increasing to counterbalance the time factor in fish deterioration. Yet in an investigation into fish marketing problems in Europe which was made in 1950, it was found that one-half or more of the fresh fish which was marketed was so old that it could not possibly be offered to the consumer as a first class product.

It is perhaps fair to assume that most consumers prefer fresh fish whenever they can get it, and freezing at low temperature has proved effective in preserving the main features of the fresh fish products. Mechanical freezing of fish on a regularly commercial basis started in the late 1920s. Before that, research had been fairly extensive. In particular the German investigations in the years 1915-16 on the formation of ice crystals in the freezing of food attracted attention. As a result the importance of rapid freezing was recognized. The remaining question was how low the temperature had to be in order for the freshness of the fish to be preserved.

It was soon established that microbial invasion and putrefaction were completely suspended at about — 9.5 degrees centigrade (15° F) ; so, as far as this is concerned, the fish cannot go bad. But other forces, more resistant to cold, are still in action and would spoil the fish in storage in a matter of weeks. The reason for this is the husky enzymes, once so indispensable for the well-balanced metabolism in the living fish tissues. In the dead fish they are thrown out of balance and through some complicated process, as yet only vaguely known, the texture of the fish is gradually destroyed. The only remedy so far seems to be a further lowering of the temperature which will further slow down the detrimental reactions. At storage temperatures of —29 to —31 degrees centigrade (— 20° to — 25° F) most fish species keep well for several months, and on this experience fairly prosperous chains of fish freezing and distribution have been built up in several countries.

Of the world's total catch in 1952, 1 million tons or some 4 per cent went to the freezing industry. Quantitatively the United States is still the largest producer and by far the most important in large-scale freezing. Total production of frozen fish in the United States increased from some 40 000 tons in 1925 to some 76 000 tons in 1938, 94 000 tons in 1947 and 116 000 tons in 1951. Canada followed in the 1930s ; Europe started rather late, hesitatingly and not without failures. In Iceland the exports of frozen fish increased from 270 tons in 1935 to 27 000 in 1947

and 46 400 tons in 1955. With the introduction of the freezing process came the extended use of filleting, which was also often applied to the iced fish. Through this process "new" species such as rosefish (redfish) grew in importance. For Europe as well as for North America it is true that large-scale fish-freezing took place in the inter-war period on board mother ships which got their fish supply from smaller craft, accompanying them and doing the fishing. A French trawler was equipped for freezing on the fishing ground. However, marketing difficulties and many unexpected problems resulted in these efforts being abandoned after a few years. Yet it is clear to many that on the long view there is no way round freezing at sea if the quality is to be improved. By the mid-1950s it even looked as if new experiments with freezer-trawlers on a new design would be successful. It started in the United Kingdom with one unit. But in the United States, France, and Germany also, promising experiments are carried out, and lately the Soviet Union has joined in on a big scale.

It was the invention of freezing machinery towards the end of the 19th century which led to the big development in this field. Freezing in brine, however, which was patented about 1850, is still in use. The freezing machinery which was constructed around 1890 was based on the principle of direct contact with the air and these sharp freezers are still largely used for fatty fishes. A more recent development is the so-called "air-blast" system. Here a strong draught of cold air is conducted through the goods. The indirect-contact freezing system was brought a good step forward in 1927 through the invention of Birdseye's belt freezer and in 1932 through the multiplate freezer. The latter is today widely employed for fish fillets.

In the world as a whole about 1950, some 7 per cent of the total catch was used for canning ; in the United States, the cradle of fish freezing as a commercial venture, the percentage was as high as 22.

At the end of the 19th century the canning industry, which had developed both in Europe and, later, in the United States, still held a great deal of uncertainty because it was often a matter of chance whether the pack kept properly or not. Bacteriologists who studied the micro-organisms in canning were able to change this so that canning is now under scientific control and based on acknowledged principles.

Over the last few decades, fish canning has spread to a great many new countries. In Japan the first salmon canning plant was erected in 1890 ; in Siberia a start was made in 1906. In South Africa and Morocco the canning industry grew by leaps and bounds in the 1940s.

Salmon, which was so important in the early days of the American canning industry, is still a main item. But the canning of tuna, which began accidentally in 1903 when the sardine fishery failed and is therefore a more recent industry, now ranks second only to that of sardines.

What has characterized developments in the canning process over the last two decades or so is the increasing degree of mechanization and, lately, automation. Admittedly, fish canneries have benefited greatly from progress made in the general technique of the industry in recent years. Canning has thereby been changed "from a handicraft to a modern industry" (22). Reliable can-closing equipment has been introduced. Pressure processing has been replacing the open boilers in the course of the last twenty years. Keeping quality has been improved by the greater use of pressure gauges, thermostats and recording equipment on the resorts, and by the cooler storage of canned products. The safety of canned fishery products has been enhanced and the retention of their flavour and texture improved by detailed studies in many countries of processing conditions, heat penetration, thermal death times and similar aspects and, last but not least, by the improvement in packing material.

The "old-fashioned" methods of fish processing are not to be dealt with here. While they are still important they do not characterize progress in the 20th century. We should not conceal, however, that also in these industries new methods and new products have moved in, become popular, and wholly or partly replaced other products. In the dried and salted cod industry mechanical driers are beginning to be more and more used ; this enables new regions and new countries to take part in giving the salted cod its finishing touch. In the herring industry "mild cures"—that is, marinated herring and other products cured with vinegar, sugar and spice—have become popular. But here we come close to the border-lines of semi-perishable products—"delikatessen"—of which there is a great variety ; they are quite a chapter of their own.

Looked upon as one group of processing methods, salting, curing, smoking and fish fermentation take as much as one-fourth of the total landings in the world. Some 44 per cent of this is produced in Asia and a similar portion in Europe. Here most of it is exported to Eastern Europe, including the Soviet Union, and to Latin countries in Europe and America. In North America and North-Western Europe salted cod and herring are no longer popular.

Turning again to our statistics we find that 15 per cent of the world catch is converted to oil and meal. In Europe the percentage figure is 24, in North America 23 and in Africa as high as 58. Much of the raw material comes from the augmented supply of "wastes" in the filleting plants, where 50 per cent or more is cut away ; but the greater part of it is still fresh whole fish.

Those who are alarmed at this relatively high proportion of the world's fish catch being used for non-food purposes may find it reassuring to study recent developments in the fish meal and oil industry. The technical problems in making fishmeal for human consumption are

now very near their solution. Although many marketing problems still remain to be tackled, there is some reason to believe that there will be an upswing in human consumption of fishmeal if only the price can be brought down to a reasonable level and the organoleptic properties adjusted to human desires. Refined herring oil is being used as food although its introduction as such has been somewhat retarded because its characteristics are uncertain. It is beyond doubt and has been proved through successful animal feeding that the excellent nutritive value of the clupidea species (from which most fishmeal is made) is preserved in the meal. This holds good particularly with regard to the new processes which have been worked out since the Second World War. They permit the suspended solids of the "stick-water" to be regained through a process of evaporation and to be added to the meal ; thus the so-called Animal Protein Factor (of which vitamin B_{12} is an element) is brought in.

The fish meal and oil industry at the turn of the century was very modest in comparison with the present volume and quality. In the main, its products were at that time used as a nitrogen fertilizer until, in the first two decades of our century, fishmeal was beginning to be used as animal feed.

It can truthfully be said that this outlet for the quantities caught is a main reason why the fishery for herring, pilchards and similar species has developed so rapidly in the last 20 or 30 years in Japan and Korea, in Norway and the United States, and, more recently, in South Africa, South West Africa and Angola.

Fish Consumption

There is some evidence that a certain minimum of animal proteins is indispensable in human nutrition. People also need fat, including soluble fat components of which vitamin A and D are furnished by fatty fish. The amino acids making up the proteins of fish muscles are the same as are found in mammalian muscles, and the most important contribution made by fish to the diet is readily digestible protein.

But fish contains fats and relatively large amounts of phosphorus and is a fair source of theamin, riboflavin, and neacin ; marine fish also contains a considerable amount of iodine.

These basic facts have all been established after intensive research, particularly during the last 25 years. They gain importance from man's great dependence on fish as an important food item. "In all periods and at all levels of technological progress, fish has usually played an essential part in man's diet". It is more than a coincidence that technological research on fishery products has been so much intensified over the last two decades. It is no doubt related to research done in the

general field of nutrition. This has shown, for instance, the important part that inorganic elements play in all physiological processes, and the significance of amino acids and vitamins obtainable from food. Scientists worked at the food problem on realistic evidence and its importance became recognized nationally and internationally from about the middle of the 1930s. The matter of fish supply and, correspondingly, of fisheries development is now recognized on a broad front as of great concern in the present situation.

V. *ORGANIZATIONAL ASPECTS*

The change over from sail to steam and motor entailed considerable demands on capital. And therefore, as technology changed, the economic structure of the industry also changed. In Great Britain, Germany, Japan, Canada and the United States there was a relatively early and rapid concentration into public companies. By contrast, in other countries the one-man companies and owner-skippers have existed up to the present day. This has been the case in Norway where, relatively speaking, distant water fishery is less important. One other reason for this difference is perhaps to be found in the dissimilarity of marketing conditions. In Germany and in the Anglo-Saxon countries all effort in the white fish industry was directed towards developing a fresh-fish trade. Business was often organized "vertically", the same companies being interested in both fishing and marketing. Moreover, co-ordination between the various links of the distribution chain—which better boats and gear technique made possible—became imperative; for the range of the fishing operations continually increased according as the returns from the near-by fishing grounds declined. In addition, there was an increasing demand from growing markets. In some countries the fresh-fish industry came under the control of a few big companies. Conversely, in Norway and Iceland the bulk of the white fish catch continued to be processed into salted and dried products, and no radical change in the organizational form seemed to be necessary. Such structural changes only occured later. But throughout the motorization process in all countries concerned there came the need for many of the new financing facilities, which the more expensive production methods made necessary or, at least, highly desirable. Where strong companies were not found or were hampered in their growth, the governments were called upon to finance, to guide and to support.

The very peculiar risk inherent in fishing has always made it difficult to attract investment capital. Even large companies, therefore, have often been family undertakings. In most countries the governments lent sup-

port to the growing industry by guiding and advising in a great many ways. Loan schemes have often been made and even special fishery banks set up on government initiative. Co-operative ventures were often encouraged and in Portugal and Spain corporative organizations have been responsible for the considerable growth in the fishing industry of the Pyrenean peninsula.

The first and most obvious task of public administration as regards the fisheries industry was to explore its natural setting. That work has become an integral part of practically all fishery administrations, and the last ten years have seen what we might call a real rearmament in marine research and exploration. Work on quality matters and research into fish handling and processing have also been recognized as tools in modern administration. Last but not least special emphasis has already been placed on fishing boat design and on how to find the best fishing methods—that is, such as would benefit alike on research work and the application of the scientific results. All this is perhaps the result of the industry having been recognized not only as a recruiting field for sailors in peace and war, but also—as revealed twice by war-time needs—as a supplier of valuable food.

These observations apply everywhere. The balance, now, between private initiative and joint or public enterprise will much depend on the individual country, on how its political and economic life is organized. But for all countries, regardless of their political and economic setting, it may truthfully be said that the governments have become more alert to the needs of the fisheries and to those of the people engaged in them. This is one of the many things which scarcity entails.

Despite "modernization" and the safety and comfort which it has provided to the operatives, fishermen still exchange the safety and regularity of shore life for the venture and hardship on the fishing grounds. They gamble for a great profit which is only bestowed upon very few, and the spectator may often wonder how long it will remain so in our modern times. How long will fishing offer enough incentive to attract recruits who want to wrest their living from it? And, how long will these huntsmen be satisfied with their lot?

But here we must remember that all fishing is in a way a co-operative undertaking. The reward for a good haul is shared among those who take part. There are various "lay" systems of remuneration according to which the fishermen obtain certain shares of the value of the catch. In principle this practice has not altered much, but its details have been adjusted to the changing needs of the motorized fleet. To a certain extent, it has been cushioned by special schemes offering the fishermen a guaranteed minimum income.

In the long run it will perhaps be the level of productivity and not so much the cushions which will determine whether the fisheries are

not only to survive but also to grow. We may therefore reverse the question and ask what organizational form will render the best services and make the industry rational in the best sense of the word. Many countries are now faced with the task of developing fishery industries which have been lagging behind. There are technological features which might be copied, but the organizational forms must often be tailored to specific situations ; for it is not sufficient for them to fit the industry, they must also fit into the developing pattern of their environment which in a majority of cases is now that of a welfare state. With a greater understanding of the importance of the fishery industries to the social and economic life of a country, and with the gradual integration of fisheries with the lives of the nations, this process of adjustment is likely to be considerably accelerated in the years to come.

VI. *INTERNATIONAL ENDEAVOURS*

The establishment of the International Council for the Exploration of the Sea at the turn of the century, to which reference has already been made, paved the way for useful collaboration between fishery nations in North Western Europe. Also, the council has established a pattern of research which has proved useful for similar arrangements in other regions. Like the fish, true science knows no national boundaries, and collaboration between scientists of various countries is a matter of course. Through the specialized fishery councils, however, more emphasis has been placed on the particular needs of the industry, and over the last decade or so "fishery science" has emerged as the keyword of their endeavour. But it is not confined to science ; these joint efforts which have become much more intensive since the Second World War also deal with its application in fishing and fisheries administration.

It was very much in keeping with the growing recognition of fisheries that, when the Food and Agriculture Organization of the United Nations (the FAO) was established in 1945, the founders included fisheries in their programme. Thus it became possible to co-ordinate fisheries with other food-producing industries and to assess their role with an eye to the general food problem. Moreover, through its Fisheries Division the Organization has helped in establishing some fishery councils, such as the Indo-Pacific Fishery Council, to which it provides the secretariate services. The FAO has convened technical conferences on such topics as boat building and on herring-processing technology, and through its publications and otherwise it has acted as a clearing-house of information. Through its kind offices a considerable amount of technical assistance has been rendered in the entire piscatorial field in supplement and

support of development work done by individual governments. Throughout, the FAO has been able to emphasize that all fishery matters, such as economics, technology and everything pertaining to the resources themselves, should be considered in conjunction. UNO itself has convened two conferences ; first, the United Nations Scientific Conference on the Conservation and Utilization of Resources ; this was held in 1949. Secondly, the International Technical Conference on the Conservation of the Living Resources of the Sea ; this was held in 1955. These were in the main technical conferences where natural scientists contributed most with unimpeachable evidence. But they will no doubt lead up to and be related to valuable discussions of legal and economic problems as well.

In this respect post-war developments have led to a cross-road with diverging views, manifested by such events as the Truman declaration on the continental shelf and the Anglo-Norwegian dispute before the International Court of Justice on territorial limits. It is more than a coincidence that the United Nations International Law Commission is now busily engaged on problems pertaining to the regime of the high seas and related matters. The peaceful solution of these problems is vital to the continued economical fishing by the coastal states, but the line of thought becomes a vicious circle and our hopes baffled unless we realize that we must know more about the resources to achieve such objectives. It is therefore comforting to see that the FAO has now launched a project for the thorough mapping of the world's resources.

Co-operation between nations is not confined to international organizations. More fisheries students go abroad than ever before. Fishery experts see each other more frequently ; they have become better acquainted.

It is perhaps fair to say that they have all come to realize that there must be joint effort and mutual understanding. Only thus will the technological means to which our limited natural resources are being exposed spread and become economical in a real sense and in the long run. But this may lead to the uprooting of some old concepts of national sovereignty and superiority.

Present Limits of Knowledge

While intensive research has brought fishing and fish processing a long stride forwards, the shape of our future fisheries can only dimly be discerned. For nature still hides many secrets which, at best, can only be revealed through arduous effort. Also, it is true that we do not as yet know how our knowledge of nature will agree with other converging forces in our forward drive. The knowledge which has been accumulated

over the last half-century has not yet been universally applied. There is a striking variation among areas. But we have come to realize that the application of it, which involves a wise and economical utilization with a fair recompence to the people involved, is perhaps just as difficult and important as the more classical sciences themselves. As long as this anomaly persists, it is liable to cause unrest and add to the factors which halt general progress.

When we now realize that all aquatic resources, as the rate of exploitation increases, will, sooner or later, be in need of management, it becomes a vital task to go more specifically into the peculiarities and characteristics of the individual species that compose the stocks and to study their environment and behaviour. The productivity of the sea itself is not finally explored either ; experts are still puzzled over the real potentialities of some of the tropical seas in comparison with Arctic and sub-Arctic waters.

As for fishing operations, the immediate future will no doubt see more factory ships on the grounds, and more detailed, international regulations may be needed to govern their fishing.

Here again, several sciences will merge and become furthered when they are applied in the fishing craft. The use of electricity in actual fishing is being experimented with and may eventually impinge on the efficiency of our fishing. Our present electronic gadgets for fish-finding are being improved. Last but not least, reference must be made to the prospects of using atomic energy in this industry too. Not only may its use favourably influence life and growth in the sea, it may also cause disaster or, conversely, if wisely used, help man as a predator in his struggle for profit and decent living. At the time of writing, and as far as the author knows, very little is known about this, but it constitutes a great challenge. For as long as very substantial changes are not made in our gear and boat technology or in fish prices, it will hardly be profitable to exploit less densely populated stocks and resources far away from the consumer centres. Meanwhile, and as thus our eyes are being opened to entirely new aspects, development will continue along the more conventional lines. Trawler owners will continue to run the risk of ordering new ships. New grounds will be exploited. The continual process of adjusting the gear will no doubt be carried further.

While there is reason to paint a bright picture of possibilities in marine research and fishing technology, the prospects in fish biochemistry and processing offer equal possibilities. Under the aegis of FAO, fish-processing technologists are carrying out experiments to give new forms to products which will make them suitable for tropical climates and tastes. In the field of fresh-fish preservation research is going on in many countries into the use of aureomycin and other antibiotica to combat the microbes which are so detrimental to the quality.

It may perhaps be said that when the nutritive value of fish has been fully described—and intensive research is being put in at present—then new ways to more economical fishing will also be found ; for any such improvement in our knowledge of the fish protein, of the fats and the vitamins and of the changes which they undergo while the fish is being processed and stored, will no doubt have a favourable impact on prices.

Whether this will materialize will then depend greatly on the general progress made in other fields, otherwise, ambitions, if any, will be frustrated by lack of financial resources. If the key to rapid economic development could be found, then the wide field of fisheries development could be thrown open. And here we are on the border-lines where several sciences meet. It is not only the biological and technological sciences which count in fisheries, it is also a question of understanding and exploring economic relationships. Fisheries—so long considered an isolated industry—will then be shown actually to belong to and form an integral part of the whole picture.

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THE DEVELOPMENT OF PAKISTAN *

I

PAKISTAN came into existence in 1947. Before that very few had even heard its name ; as a matter of fact, the name itself is not much older. A little more than a decade before its establishment, the name of Pakistan was invented by a student studying in the British University of Cambridge [1]. Jamal-u'ddin al-Afghani had in one of his writings expressed the view that the Muslim majority areas of northwest India, Afghanistan, and the states of Turkistan, should form a state, but of course this was little more than a bright idea. Later, the famous poet and philosopher, Iqbal, in the course of an address to the Muslim League in its session of 1930 at Allahabad, put forward the suggestion that the Muslim majority areas of northwest India should form a separate state [2]. This idea was taken up seriously by Choudhury Rahmat Ali, at that time a student at Cambridge, who invented the name of Pakistan.

It is well worth finding out how a poet's dream and a student's zeal were translated into a reality. The establishment of Pakistan assumes greater interest when it is remembered that its founder, Mohamed Ali Jinnah, was until quite late in his life an ardent believer in Hindu-Muslim unity, and a united Indian nationalism ; besides, the Muslims of India, who supported the idea of Pakistan so enthusiastically as to achieve success for it, had supported the Indian National Congress almost unanimously in the years 1918-25 with the greatest zeal [3]. They grew a little lukewarm in their support after 1925, but they did not change their

* Recommended by Dr. Caroline WARE, Author-Editor, Vol. VI.

[1] REHMAT ALI, Chowdhury, *Pakistan*, Cambridge, 1946, p. 225.

[2] *Speeches and Statements of Iqbal*, Lahore, 1944, pp. 12 ff.

[3] Hector BOLITHO, *Jinnah, the Founder of Pakistan*, London, 1954, pp. 22, 26, 58 ff.

loyalty until the idea of Pakistan caught their imagination. Such strong feelings could not have been created without adequate reasons nor without the idea expressing some deeply felt emotions which had their roots in history. All observers are impressed with the depth of national feeling which is displayed by the Pakistanis. It was the intensity of this feeling which was responsible in the initial days for the survival of the country.

If we examine the history of the Muslims living in that subcontinent, we shall be impressed by their desire to maintain their separate identity. Islam had a deep influence upon Hindu thought ; it created a ferment when its dynamic and simple doctrines challenged the complex philosophy and ritual of Brahmanism. Islam being a missionary religion sought converts, which could be done often by argument and polemic, but its more significant achievement was to penetrate Hindu thought itself. Hinduism reacted by absorbing the more appealing doctrine of the unity of God, and a recognition of the merit won by devotion and piety by human beings irrespective of birth or position.

A strain of monotheism, weak and vague, had existed in Hinduism, and its offshoots, like Buddhism and Jainism, had revolted against the disabilities imposed by the caste system ; but, faced with the challenge of Islam, these elements were brought into prominence [4]. Indeed, Hinduism, in its characteristic manner, developed an armour by emphasizing these values in the Bhakti Movement, and preaching the doctrine that all religions were but different paths leading to the common goal of God consciousness and virtue. This, in its turn, influenced the Muslims whose feeling of distinctness was in danger of being weakened. The first reaction came in the form of the Mahdawi Movement, founded by a learned pious, and sincere theologian, Saiyid Muhammad, of the famous university city of Jaunpur, who claimed to be the Mahdi, chosen for the Messianic task of restoring Islam to its original vigor and purity ; but, because this claim offended orthodoxy, the movement dwindled into a small and unimportant schism, though for some time its popularity and strength were phenomenal [5].

When laxity and heterodoxy, engineered by the philosophy of the Bhakti Movement, enticed the Mughul court and found a patron in Akbar, its political implications became serious enough to lend strength to the movement of Shaikh Ahmad of Sahrind, commonly called Mujaddid-i-alf-i-thani, or the Resuscitator of Islam in the second millennium of the Hijri era. He applied himself to the reform of the people and the court alike, and achieved considerable success. The official

[4] Tara Chand, *The Influence of Islam upon Indian Culture*, Allahabad.
[5] Erskine, *History of India under the First two Sovereigns of the House of Taimur*, Vol. II, pp. 475 ff.

patronage of heterodoxy was withdrawn, and the objectionable features of speculative mysticism were curbed, creating a reaction against laxity [6].

With the death of Aurangzib in 1707, the Muslims began to lose their political power, which fact also called for intellectual as well as political power, which fact also called for intellectual as well as political effort on the part of the religious leaders. Shah Wali-u'llah brought about the organization of the Muslim confederacy which defeated the Marathas at Panipat in 1761 ; he also produced voluminous literature dealing with political, social and economic causes of the decline of the Muslim power ; he tried to rid Muslim society of un-Islamic practices and ideas which had weakened their cohesion and power of resistance. He also created an awakening by translating the Qur'an into Persian which was the most common vehicle of literary expression in those days. This was a revolutionary step because with the possible exception of the effort of a Berber potentate, the Qur'an had never been translated before ; many were of the opinion that it was improper to try to do so because of the belief in the verbal infallibility of the sacred text [7]. Shah Wali-u'llah established a tradition and a school ; the movement of Saiyid Ahmad of Raebareli, who was ably assisted by Shah Isma'il, was almost an offshoot of Shah Wali-u'llah's work. The Fara'idis of Bengal were inspired by similar ideals. The disastrous end of the war waged by Saiyid Ahmad against the Sikh kingdom of the Panjab in 1831 struck a severe blow to his martial program; the British mopped up his warriors when imperial territories reached, in their expansion, the outskirts of their strongholds and imprisoned and crushed his workers who had worked among the civilian population ; but the religious aspect of the movement never died out ; on the other hand, it leavened Muslim thought in the subcontinent and is a force even today [8].

The British had looked upon Muslim consciousness with suspicion and had victimized them in various ways during all this period ; Muslim discontent, which was a measure of their political awareness, grew proportionately and ultimately exploded in the Mutiny of 1857. Terrible was the vengeance of the British [9]. The Hindus had mostly stood apart ; only a small section had taken active part. The discriminatory treatment

[6] FARUQI, Burhan Ahmad, *Mujaddid's Concept of Tawhid*, pp. 8-19, 95-100.

[7] *Islamic Culture*, Hyderabad, 1948, AL-MASUMI, « An Appreciation of Shah Wali-u'llah al-muhaddit a'd-Dehlawi »; also *Islamic Review*, London, Vol. XXXVIII, N° 10 (October 1950) ; M. ABD-UL-BAQI, *Theories of State and Problems of Sociology as expounded by an Indian Muslim Divine of the 18th Century* ; also *Islamic Culture*, 1951, K. A. NIZAMI, "Shah Wali-ullah Dehlawi and Indian Politics in the 18th Century".

[8] For his biography, vide *Sirat Saiyid Ahmad Shahid* ; also *Sawanih Ahmadi*, by Muhammad JA'FAR THANESARI, published by The Sufi Publishing Company, Pindi Baha-ud-din ; also, W.W. HUNTER, *Our Indian Musalmans*.

[9] Edward THOMPSON, *The Other Side of the Medal*, chapter II, gives but a glimpse of the picture.

meted out to them before the Mutiny and their common suffering during it strengthened their feeling of distinction from the other inhabitants of the subcontinent. Therefore, when Sir Syed Ahmad Khan came to the forefront as their leader, he made it amply plain that he considered the Muslims a distinct people ; he adopted a policy of reconciliation towards the British ; he advocated friendship with the Hindus, but he did not believe in merging the identity of the Muslims with others. He compared the Hindus and the Muslims in India to the two eyes in the body, but all his efforts were directed towards preserving their identity [10].

That was also the policy of those who assumed the leadership after him ; hence the demand for separate electorates when the British decided to give the Indians a measure of self-government [11]. At no time had the Muslims felt that they and the Hindus were the same people ; they had lived in the same villages, townships and cities ; they had dealings with them and often friendly relations ; but they had lived almost as strangers. Hindu and Muslim quarters were almost invariably different ; Hindu ideas of caste and untouchability made closer contacts impossible, because a Hindu would not eat food touched by a Muslim ; Hindu and Muslim codes alike prohibited inter-marriage.

Economic competition and the struggle for employment made the situation worse [12]. Hindu revivalist movements were equally a potential cause of widening the gulf ; the Hindus began to look upon the Islamic past as a period of foreign domination and therefore, for the purification of their own classical tradition, tried to root out such elements from their culture as they had adopted under the influence of Islam. All these factors combined first to alienate the two peoples and then to create hostility, which too often assumed the form of destructive riots. These disturbances assumed large proportions towards the end [13]. Therefore, when the theory of the Hindus and the Muslims being two different nations was propounded, it found ready acceptance among the Muslims. Pakistan is only a corollary of this theory. The enthusiasm of the Pakistanis is, therefore, based upon genuine feelings of consolidation among themselves and distinctiveness from others ; they seem to have been waiting only for an enunciation of their own deep, though subconscious, yearning.

[10] Sir Syed Ahmad KHAN, *The Present State of Indian Politics*, in which he says : "The proposals of the Congress are exceedingly inexpedient for a country which is inhabited by *two different nations*" (the italics are mine).

[11] The demand was put forward by a deputation led by the Aga Khan, which met the governor-general, Lord Minto, on October 1, 1906. It was conceded and embodied in Minto-Morley Reforms of 1909, vide BUCHAN, *Lord Minto, A Memoir*, pp. 243 ff. ; also *Simon Commission Report*, Vol. I, p. 183.

[12] NEHRU, *Autobiography*, chapter 56, also p. 138 ; also *The Muslim World*, Vol. XLIV, N° 1, pp. 1-11.

[13] AMBEDKAR, *Pakistan*, pp. 152 ff.

II

When the demand for Pakistan was conceded, it seemed to all observers that the difficulties in the way of its founders would be insurmontable ; indeed, it was thought in certain quarters that they would soon approach India for reunion [14]. Such prognostications, however, proved to be utterly erroneous. Despite the facts that a central administration had to be organized without adequate personnel in a new town, and the organizers themselves were mostly inexperienced ; there existed little equipment and less statistics or data to work upon ; the new government did not possess even a rough knowledge of its revenue resources ; there was difficulty in getting Pakistan's share of its cash balance from India so that there was little money to carry on the administration from day to day ; the economic life of the country was disorganized because of the large scale migration of the Hindus, who had controlled both the wholesale and retail trade and such little industry as existed. It has by now passed into a cliché that the Pakistan government had no chairs, no tables, no typewriters, very little paper, and too few pens and pencils to go around [15].

As if these difficulties were not enough, refugees began to pour into the country in large numbers, so that millions of them crossed into Pakistan in a period of four or five weeks ; and before six months were out, the government was confronted with the task of rehabilitating more than six million persons most of whom were practically destitute. Today the number of persons who came to Pakistan as refugees is more than seven million [16]. It would have been impossible to deal with this problem satisfactorily and without dislocation even for a well-established government ; it was little short of a miracle that Pakistan was able to settle such large numbers when its government was so disorganized. It is true that there are still housing difficulties—the foreign visitor still sees a large number of refugees living under gunny sack huts in subhuman conditions in the federal capital, Karachi—but the major portion of the problem has been solved ; even in Karachi, government and private effort are within sight of removing housing shortage. Karachi presented special difficulties ; it was a small provincial town with a population of three hundred thousand at the time of the establishment of Pakistan ; today, more than a million and a half people live in it. At the time of the decennial census in 1951, the population had already

[14] CASEY, *An Australian in India*, London, 1947, p. 79 ; also COUPLAND, *India, A Restatement*, Oxford, 1945, p. 261.

[15] For comparable conditions in East Pakistan, vide *Five Years of Pakistan, a Brief Survey*, Pakistan Publications, Karachi, 1952, pp. 5-6.

[16] Census of Pakistan Report, 1951.

reached the figure of a million and three hundred thousand ; within four years, it had more than quadrupled itself ; the city did not possess sources of an adequate water supply, and the dispersal of the additional population was impossible without increasing the capacity of the reservoirs and the seventy-mile pipeline which brings the water all the way from the Indus.

The situation was further complicated by the fact that Pakistan inherited like many other areas an economy which had been adversely affected by the Second World War ; even before the Partition, there had started the exodus of the Hindu and Sikh population, who were mostly traders, bankers, craftsmen and shopkeepers. After the Partition, the volume of the migration increased. Even in Sindh where there was no disturbance, the majority of the Hindu population chose to migrate under strong persuasion from their leaders who seemed to be justified in believing that if they left the country, its economy would collapse, because the Muslims were mostly cultivators or landlords. For a little while, it seemed that their calculations were correct ; but very soon, the Muslims stepped into their place, and, taking into consideration their inexperience, they achieved remarkable success in putting the economy of the country on a sound basis [17].

The administration began to work smoothly sooner than could be expected under such circumstances ; the bare necessities in furniture, equipment and stationery were assembled, and what was lacking in equipment was made up by the enthusiasm of the personnel of the secretariat. Officers and clerks sat on deal packing cases and worked overtime to create order and system out of disorder and chaos ; gradually, an administration began to take shape ; soon it was running with reasonable efficiency. In hastily constructed shacks sat a devoted band of workers who were hardly conscious of the fact that they were making history. It is true that even now the government of Pakistan suffers from a lack of highly trained and experienced personnel ; efficiency is not as high as in more developed and experienced countries, but it is higher than in several older Eastern states and compares favorably with the standards in some European areas. In the earlier days, it was necessary to lower the standards of recruitment ; the younger men now serving and under training have been better selected.

When power was transferred to a Pakistani government, the nation did not possess a defense force worth the name ; it had a small naval establishment at Karachi which it had inherited as its meager share from the British ; such soldiers serving in the old Indian Army under

[17] *Five Years of Pakistan*, pp. 17-18 ; also, *Pakistan 1953-54*, Pakistan Publications, Karachi, pp. 39 ff.

the British as had opted for Pakistan were scattered all over the subcontinent and in some overseas British territories. It took some time to assemble them and even when they could be collected, there was a paucity of officers. In the beginning, Pakistan thought it advisable to ask some of the retiring British officers to remain for reorganizing the army until Pakistani officers were able to take over ; now the army has been thoroughly nationalized. The morale and discipline of the armed forces as well as their training have earned for them the praise of friendly countries. Today, Pakistan possesses a good and reliable army, capable of defending its frontiers, a small well trained navy, and a well appointed air force sufficiently large to give air cover to the Army in action. Pakistan, in spite of its limited financial resources, has not stinted money on building up a good defense force ; this has meant considerable hardship and sacrifice, but it has given the nation a sense of security to the extent that it is possible to feel safe in a troubled world. Pakistan has at least the satisfaction of having done its best under difficult circumstances, and of possessing one of the most compact and disciplined forces in that area [18].

III

A problem of great complexity, which baffled solution for several years, was the drafting of a satisfactory constitution for the country ; the difficulties arose because Pakistan is divided into two parts with more than a thousand miles of Indian territory lying between the two. The distance is reflected in the different geographical and economic features of the two parts, which in turn affect political relations. West Pakistan is larger in area, covering about 310,236 square miles ; whereas East Pakistan has only 54,501 square miles. The latter is more thickly populated, having a population of forty two million, with a density of 777 to a square mile. West Pakistan's population is thirty four million, eight million less than that of East Pakistan [19]. West Pakistan is divided into highlands, covering about half of its area, and the alluvial plains, mostly dry and irrigated by an elaborate system of canals which are fed by the Indus and its tributaries. The highlands are, in the north, ranges of high mountains enclosing narrow valleys, some of which are very fertile ; in the south, they are a series of tablelands at various altitudes divided by mountain ranges ; these are mostly dry, but wherever

[18] Richards SYMONDS, *The Making of Pakistan*, London, pp. 175-176 ; also, *Pakistan 1953-54*, pp. 160-175.

[19] *Pakistan Basic Facts*, second edition, Pakistan Publications, Karachi, 1954, p. 2.

water is available, these tablelands produce good harvests and excellent fruit. In spring, as soon as the snow melts, they are carpeted with vegetation and flowers, even where there is no irrigation ; but, of course, such areas soon resume their brown mantle. Because of the artificial irrigation, the plains are the granary of West Pakistan, and in normal years they produce sufficient food to have a small exportable surplus. The plains, being productive, are more thickly populated ; population is very sparse in the highlands. The main cash crop of West Pakistan is cotton ; recently, the cultivation of tobacco has made great progress. The dominant racial type is Aryan. In East Pakistan, the main racial type is Dravido-Mongoloid. The country is riverine, being mainly the delta of two mighty rivers, the Ganges and the Brahmaputra ; their branches cut up the country into tracts of varying sizes surrounded by water. A stream may be as broad as ten miles during the dry weather which lasts for four to five months in the year. At the height of the monsoon season, the province looks like a big sheet of water dotted with a number of islands. The rivers provide the main means of communication ; the railways and the roads act mostly as feeders. Rice and fish are the staple diet ; in West Pakistan, the population is wheat-eating. Jute is the main cash crop of East Pakistan ; in better qualities of jute it holds a virtual monopoly [20]. Urdu is the chief vehicle of literary expression and the *lingua franca* of West Pakistan where several other languages and dialects are spoken ; the script of all of them is modified Arabic. In East Pakistan, however, the universal language is Bengali, which is written in a Sanskritic script. Urdu has a large proportion of Arabic and Persian words in its vocabulary ; Bengali is almost entirely Sanskritic. Urdu is fully Islamic in feeling ; Bengali can not escape the dominance of Hindu ideas [21]. Before the Partition, Urdu was looked upon as the common heritage of the Muslims of the subcontinent ; hence, the leaders of the Pakistan movement started with the assumption that Urdu would be accepted as the state language of the country. Gradually, however, opposition developed in East Pakistan to the idea, and the demand was put forward, that Bengali also should be given the same status. Ultimately widespread riots and disturbances showed the intensity of Bengali feeling and provided one of the reasons of the landslide vote against the Muslim League in the provincial elections. The first Constituent Assembly recognized the strength of Bengali sentiment and accepted a resolution acceding equal status to Bengali [22]. Bengal had

[20] Idem, pp. 1-10.
[21] Presidential Address by Allamah Saiyid Sulaiman Nadwi, Pakistan, History Conference, 1953, pp. 12-13.
[22] *Report of the Basic Principles Committee as adopted by the Constituent Assembly of Pakistan*, 1954, p. 72.

demanded representation in the proposed federal parliament in accordance with the population, which would have given it a majority ; this was not acceptable to other provinces. It was, however, recognized in responsible circles that Bengal's demand could not be accepted or even pressed reasonably ; the leading representatives of Bengal, therefore, accepted the principle of parity of representation in the federal legislature. The Basic Principles Committee recommended that Bengal should have half of the seats in each of the two houses which were to constitute the parliament [23].

This created difficulties in another quarter where it was least expected. The representatives of the Panjab had signed the report without demur on this point. Two of them had resigned their memberships on other points of a nature in which the interests of no province in particular were concerned ; it transpired much later that these should have been taken as indications of an impending political storm. As soon as the report was published, an agitation was worked up in the Panjab, which totally rejected the idea of parity ; even those who had privately put forward other methods of applying the principle went back upon their proposals [24]. All this was a prelude to the dismissal of the government led by Khwaja Nazimuddin [25]. When he was replaced by Muhammad Ali, efforts for finding a compromise were renewed ; this time they were more successful. The seats in the two proposed houses were so distributed that the popularly elected house would reflect the population of the various provinces, and the other house would be indirectly elected by the legislatures of the different provinces and states grouped into four voting units, all units being equally represented.

The distribution, however, was made in such a manner that an overall parity was achieved in the parliament between West Pakistan and East Pakistan. The two houses were given equal powers and a joint session was provided in case of deadlock. Thus parity against which Panjab had revolted was once again accepted in a different form. All seemed to be well for the moment ; the formula, called Muhammad Ali formula, because it had found acceptance under the new Prime Minister, was hailed in every part of Pakistan [26]. The optimism, however, did not last long. According to the formula the provinces of Pakistan were grouped into several units for representation in the upper house, because otherwise it would have been impossible to find seats for so many provinces and states on the basis of equality and yet maintain parity between East and West Pakistan. When the recommendations of the Basic Prin-

[23] Vide *Basic Principles Committee Report*, 1952.
[24] *Dawn*, Karachi, January 12, 1953.
[25] Idem, April 18, 1953. The cabinet was dismissed on the previous day.
[26] Idem, October 9, 1953.

ciples Committee were still under discussion in the Constituent Assembly, and after the formula had been accepted, a prominent member from the Panjab, who had been associated with the discussions throughout, declared that he wanted the whole of West Pakistan to be united into a single province. His statement was an indication that Panjab was again dissatisfied [27]. The Assembly, however, went on with its work and completed the consideration of the recommendations ; the constitution was almost ready ; all that remained was that the Drafting Committee would present a bill incorporating the constitution for consideration by the Assembly. The Prime Minister announced that the new constitution would be enforced on the twenty-fifth of december [28]. There seemed to be no further obstacle in the way ; it was almost certain that the Prime Minister's announcement would be honored. The Assembly, having to wait for the draft, went into recess. At this time, Ghulam Muhammad, the governor-general, dissolved the Assembly [29]. The entire question of a constitution again went into the melting pot. It is perhaps necessary to explain the reasons behind the governor-general's action.

A few months before, in march 1954, the Muslim League had been badly defeated in the provincial elections of Bengal. It was, therefore, argued that the members from East Pakistan had lost their representative character ; this argument was met by the government by the legal contention that a provincial election did not affect the position of the central legislature ; besides, the Bengal elections were fought on provincial issues [30]. At that time, the governor-general seemed to endorse this action because he neither took any action nor did he express any opinion to the contrary. The Assembly, before dispersal, had offended him by reducing his powers. It would, however, be wrong to think that personal considerations were paramount in his mind. It is difficult always to disentangle personal motives from considerations of a public nature. It has been mentioned that some Panjabi leaders were anxious to unite the whole of West Pakistan into a single province. If the draft prepared for the Constituent Assembly had been permitted to become law, it would have been extremely difficult to amalgamate the provinces and states of West Pakistan into a single unit, even though the draft constitution provided for the amalgamation of two or more provinces or states if their legislatures so desired. The remedy, therefore, from the point of view of the governor-general and the circle of his friends, seemed to be to strike before the constitution was enacted. His action was of extremely

[27] Constituent Assembly of Pakistan, debates, Official Report, vol. XVI, No. 27, pp. 358-459.
[28] Idem, No. 31, p. 504.
[29] *The New York Times*, October 25, 1954.
[30] Vide the twenty-one points of the United Front Election Manifesto.

doubtful legal validity and created a host of other legal difficulties, and for some time it seemed that the rule of law and democracy were in danger in Pakistan [31]. Public opinion, however, asserted itself. The matter was taken to the Federal Court, and the government was forced to agree to the election of a new Constituent Assembly, which has now succeeded in framing a constitution [32].

As the result of these political difficulties, the international prestige of Pakistan received considerable setback ; frequent changes of government created the feeling that the country has not achieved political maturity. It is true that as a new country, Pakistan lacks the experience of older countries ; but there are encouraging signs as well. During the last political crisis (1954-55), when it seemed that the rule of law might be replaced by a dictatorship, there was considerable frustration among the people. Far from being beguiled into supporting such a move, they opposed and ridiculed the idea. They, however, in view of the external difficulties of the country, did not indulge in riotous demonstrations ; nor did they take such steps as, by bringing them into open conflict with authority, might have led to a breach of peace ; on the other hand, they took the matter to the Federal Court ; and though they did not get full redress, they were able to thwart any desire that might have existed in the government to govern without the supervising authority of a legislature [33]. Such restraint does not show immaturity and is a happy augury for the future of democracy in Pakistan. The manner in which the nation overcame the initial difficulties which built up its prestige abroad is another indication. When the constitution is implemented and a new directly elected parliament takes over, the position, in all likelihood, will be retrieved.

This discussion is likely to leave an impression that before the enactment of the new constitution there was no fundamental law in existence in Pakistan in accordance with which the various organs of government were constituted. Actually, Pakistan did possess a working constitution. The Government of India Act of 1935 was, under the authority of the Independence Act of 1947, adapted to suit the altered circumstances initially and the Constituent Assembly made many subsequent amendments. This provided a fairly full and elaborate fundamental law. The need for a constitution arose because Pakistan wanted to have a constitution which would more fully reflect its needs and genius. The latter

[31] Miss Jinnah's statement, published in *The Pakistan Standard*, April 15, 1955.
[32] Vide *Dawn*, March 1, 1956.
[33] The Federal Court of Pakistan's Judgments on (1) the appeal of Yusuf Patel and others delivered by the court on April 12, 1955, report and text published in *The Pakistan Standard*, Karachi, on April 13 and 14, (2) Governor-General's reference, delivered by the court on May 10, 1955, and report and text published in the *Pakistan Standard*, Karachi, on May 11, 1955.

factor also has been a subsidiary cause of delay, because considerable time was spent in finding out whether the deep loyalty to Islam, which is a predominant character of Pakistani sentiment, could be incorporated in the constitution. This matter was discussed at great length not only in the Constituent Assembly, but also in the press and from the platform ; the Political Science Association of Pakistan debated it, and learned theologians pondered over it in the meetings of their various societies [34]. As could be expected, all this discussion revealed a great divergence of views. The theologians and many others of their way of thought were of the opinion that the Assembly should seek light from the precedents of the days of the first four caliphs ; others were of the opinion that whereas the pious caliphs had acted upon the principles of Islam, their interpretation of these principles was necessarily limited by the exigencies of the times in which they lived. The position was considerably clarified by the time the Objectives Resolution was adopted. The best speech was by the Prime Minister, Liaquat Ali Khan, who well defined the point of view not only of the ruling party, but also of the enlightened section of Muslim opinion [35]. The Objectives Resolution, as well as the speeches in its support, laid down the broad definition of what was meant by an Islamic polity by the Muslim League at that time.

Pakistan was to be a modern state, democratic in form as well as spirit, governed in the interests of the people by their representatives elected by them, with equality of opportunity for all. All citizens, without any distinction of creed, were to have equality before law ; the minorities were to be protected and their freedom to profess and practice their religion freely was to be guaranteed. In short, all the characteristics of a modern democratic state were included. The Islamic element was brought in by laying it down that the constitution should "enable the Muslims" to order their lives in accordance with "the Qur'an and the sunnah". Among those who enthusiastically supported the resolution was the doyen of the Muslim theologians of Pakistan, Maulana Shabbir Ahmad 'Uthmani, which shows that the modernist and conservative theologians alike approved of the principles enunciated in the Objectives Resolution [36].

It is, however, easier to agree upon the broad principles than to apply them in detail, as was soon demonstrated. The question as to what is an Islamic state has now been debated not only in Pakistan, but also in other countries, Muslim as well as non-Muslim ; it has not been

[34] *Proceedings* of the first and second sessions of All Pakistan Political Science Conference, 1950, 1951.

[35] Constituent Assembly of Pakistan, Debates, *Official Report*, vol. V, No. 1, pp. 1-7.

[36] Id., vol. V, No. 3, pp. 43, 47.

possible to achieve unanimity, nor could complete unanimity be expected among the members of the Constituent Assembly. The report of the Basic Principles Committee was the result of mature deliberation on this point, and had taken into consideration popular sentiment as well as the well being of the state [37]. The committee itself was so constituted that the overwhelming sentiment was Islamic. They recommended that the head of the state should always be a Muslim and that the parliament should not legislate any laws which contravene the Qur'an and the sunnah. As the report had taken good care that the head of the state should be a constitutional dignitary and all real power would lie in the hands of the Prime Minister and his cabinet, this implied no real hardship to the non-Muslim minorities ; and, in the matter of legislation, the final authority was left with the parliament. An elaborate procedure was laid down by which the attention of the legislators could be drawn on the floor of the house to any alleged breach of the principles of Islam, when it would be incumbent upon them to refer the question to experts, whose opinion they could accept or reject ; besides, the courts were debarred from adjudicating whether an act of the parliament was against the Qur'an or the sunnah. The reason for this provision was that the Committee felt that the legislators should have the final say in deciding what conformed to the conscience of the community, because the people would be inclined to be progressive in accepting interpretations which corresponded to the needs of the times, and legislation would not be entangled in the meshes of proverbial legal and theological conservatism.

In short, what the Committee aimed to achieve was to make it impossible for the legislators to ignore religious objections without taking the risk of unpopularity, and losing elections if they flagrantly went against Islam, and yet permitting them the freedom of following such interpretations as were not indifferent to progress and the changing needs of a growing society. This was; however, changed by the Assembly when it adopted basic principles. It replaced the procedure proposed in the Report by permitting appeals to the Federal Court on questions relating to the validity of legislation with reference to the Qur'an and the sunnah [38]. A number of even religious minded Muslim members saw danger in these provisions because the principles in which the Federal Court was to base its judgment have not been codified and, like all religious teachings, often admit of different interpretations ; thus, the Federal Court would find itself in the uncomfortable position of being the highest religious authority in the land. In view of the fact that the membership of any court could not, without violating the pro-

[37] *Report of the Basic Principles Committee as adopted by the Constituent Assembly of Pakistan*, 1954, pp. 1-5.
[38] Id., p. 4.

posed fundamental rights, be limited to Muslims alone, this would be a highly anomalous position. Even the provision contained in the Report was not perfect and can be criticized from several points of view, but it certainly embodied much political wisdom. A remarkable testimony to its wisdom was that it was acceptable not only to progressive and liberal minded Muslims, but had also the approval of the theologians associated with itself by the Basic Principles Committee in the discussion of this problem. The new constitution had accepted the contention that the question whether any act of the legislature violates the teachings of the Qur'an and the traditions of the Prophet should be justiciable and therefore the ruling of the Federal Court will be final on the point; but it has made the provision that a commission will first be set up to codify those basic principles which will be thus enforceable.

In other matters, the constitution broadly follows the pattern set by the First Constituent Assembly, though there are important departures. The question whether the constituencies for provincial and federal legislatures will be common or divided in accordance with religious communities has been left to the provincial legislatures, whereas the former draft had provided separate electorates. Even before dealing with the constitution, the new Assembly amalgamated all the states and the provinces of Western Pakistan into a single province, thus dividing Pakistan into two provinces. Thus the way for providing parity in the federal legislature was cleared. Now there is to be a single house of parliament at the federal level, which will be popularly elected on the basis of adult franchise, and will consist of an equal number of representatives from the two provinces of West Pakistan and East Pakistan. Pakistan will be a republic, but the Assembly has resolved that it will continue its association with the Commonwealth of Nations and will recognize the Queen of the United Kingdom as the symbolic head of the Commonweatlh, though she will not be the queen of Pakistan or hold any sovereign status there. The President of the "Islamic Republic of Pakistan"—because that is the official name of the country—will be elected by the Parliament and will be purely a constitutional head. He must be a Muslim. The real authority, however, is vested in the cabinet of ministers who will be responsible jointly and collectively to the parliament and hold office as long as they have its confidence. The Prime Minister will wield the greatest authority as the head of the government.

The fundamental rights are justiciable and recognize the equality of status and opportunity for all irrespective of creed, race or sex. Women have equal franchise with men. Freedom of religion, association, and expression of opinion have been guaranteed. The two provinces have their own legislatures and they will have their provincial cabinets working on the same principles as the central federal cabinet and par-

liament. The authority of the federal and provincial governments has been well defined ; the federal government has control over all matters relating to defense, foreign relations and currency. The other subjects are with the provinces. This is a departure from the recommendations adopted by the previous Assembly, which was in favour of greater centralization.

The new constitution will come into effect on March 23, 1956, the anniversary of the day when the Muslim League first adopted the resolution demanding a separate state for the Muslims.

IV

If Pakistan has faced difficulties in framing its constitution and its politics have been subject to selfish maneuvering and intrigue on the part of a small group of persons, it has made rapid strides in other directions. It has survived the death of its founder, Mohamed Ali Jinnah, and of its first Prime Minister, Liaquat Ali Khan, both men of towering personalities and exceptional ability and devotion. Without a leader of any stature, it has, in spite of shortsighted and suicidal machinations on the part of some of those in authority, maintained administrative equilibrium and the pace of steady progress which was set for it by its first two leaders. It has already been shown how the people averted a grave danger to their liberties in a constitutional and dignified manner ; if they had, in their excitement or frustration, behaved irresponsibly, the results could have been disastrous. In every sphere of activity, the pace of progress has been maintained.

The most satisfactory progress has been made in industry. When Pakistan was established, it had virtually no industry. The index of industrial production has gone up from 60 in 1948 to 380 in 1955. In 1947, when Pakistan came into existence, 80 % of its population was employed in agriculture. The standard of living was low, and the per capita income was less than $ 65 per annum [39]. It was obvious that the people could be helped only by undertaking a program of development. It was therefore decided to launch a program of creating some balance in the economy. It was realized that agriculture will long remain the basic industry of the country ; hence, it could not be neglected. The basic industrial program was, therefore, centered around the agricultural products of the country.

For this purpose, and to give some relief to the peasant, it was necessary to develop agriculture as well. Indeed economic development could

[39] *Pakistan, Free Enterprise*, published by the Embassy of Pakistan in Washington, D.C., United States of America, 1955, pp. 1-3.

begin most profitably with agriculture. Great attention was, therefore, devoted to enlarging the means of irrigation. The most notable achievement has been the completion of Kotri Barrage near Hyderabad, on the Indus, which will bring under cultivation two million acres of land [40]. The desert area of Thal is being gradually converted into a smiling land of green fields and well planned clean and prosperous villages. Water has been brought from Jinnah Barrage, on the Indus near Kala Bagh, into an expanding network of canals. It was quite a grim struggle against the ever encroaching sands of the desert, and the fight is by no means over. But where the battle has been won, the results have been spectacular. Small industrial townships have been built in the area to provide an easily reached market for the raw agricultural produce of this newly developed area ; a few factories are nearing completion. When fully developed, Thal will bring a million and five hundred thousand acres under cultivation. Even larger than these projects will be the Mangla Dam, which is now being taken in hand. It is estimated to cost $ 161,000,000 ; it will irrigate three million acres, and generate three hundred thousand kilowatts of energy [41]. Another barrage at Taunsa will irrigate seven hundred and ten thousand acres besides providing a bridge at an important point for a railway link with an area which needs opening up to raise the standard of living of the population. In the tribal territories on the northwest frontier, the Kurramgarhi and Warsak schemes, with a high level canal, will bring fertility to three hundred and sixty-three thousand acres.

Another ambitious scheme is that of a barrage on the Indus, at Giddu, which will bring two million and one hundred and forty-five thousand acres under cultivation. In East Bengal, where rainfall is plentiful, there is not much need for irrigation ; but here, as well, advantage is being taken of natural facilities. The Teesta Bridge and Ganges Kobadak Schemes, in their initial stages, will provide irrigation facilities to one million and three hundred thousand acres of land. Besides, several minor schemes have been undertaken which are in various stages of development ; some have been completed. Their cumulative effect on the economy of the country will by no means be insignificant. The most important of these is the Rasul Tubewell Project which is intended to reclaim three hundred thousand acres of land ; this project has now been almost completed. Baluchistan does not possess adequate water resources ; the land is fertile, but rainfall is scarce, and there are no large rivers which could be harnessed for irrigation. The traditional method of irriga-

[40] *Pakistan 1953-54*, p. 80, Pakistan Publications, Karachi.

[41] Speech broadcast by Choudhury Mohamad Ali, Finance Minister, on March 31, 1955, and published as *Pakistan Budget, 1955-56*, by Pakistan Publications, Karachi, 1955, p. 11.

tion is the *karez*, a tunneled channel for the flow of water from subterranean deposit accumulated mostly by percolation from melting snow on mountains. The higher altitude of these deposits makes the flow easier. This is an expensive process, and even for *karezes*, there is not sufficient water. A series of minor works, therefore, was the only solution ; these are of the nature of building small dams across small streams, contour trenching to prevent soil erosion, the conserving of flood water when the thaw sets in, and the construction of reservoirs wherever there is likely to be sufficient accumulation of water. Sometimes reservoirs prove useless because of the porous nature of the soil, and they have to be lined if that is economically possible ; otherwise, the cultivators have to wait until sufficient silt has been deposited to hold the water from escaping through subterranean crevices. Considerable progress has been made in the completion of such schemes [42].

Most of the major projects are multi-purpose and are designed to help in controlling floods and to produce power. Fifty two thousand kilowatts of hydraulic power have by now been added to the available resources since Independence, and when the projects already in hand are completed, another five hundred thousand kilowatts will be produced. Besides, between 1947 and 1954, there was an addition of a hundred thousand kilowatts of thermal power. The production of oil was more than trebled between 1948 and 1953, though the total output is still small because of the inadequacy of the known deposits. The search for oil continues, and experts are not without hope.

In the search for oil was discovered a large deposit of natural gas, which is now being exploited and promises to give a great impetus to industry [44]. The reserves of gas in this field are estimated in the neighborhood of four million cubic feet. These are "proved" reserves as computed by experts from the size and character of the reservoir, the pressure, and other physical factors. There are coal deposits as well, but the coal is mostly of a poor quality, containing a large proportion of sulphur. Its utility, however, is increased by scientific processing ; hence, because of an increased demand, its output has increased by 100 % in six years [45].

Industry has made rapid progress since the establishment of Pakistan. At the time of the transfer of power, Pakistan had no mills to manufacture jute goods, woollen textiles, paper, cardboard, processed foods

[42] *Five Years of Pakistan*, Pakistan Publications, Karachi, n. d., pp. 21-23 ; also *Pakistan 1953-54*, p. 80 ; *Basic Facts*, pp. 57-59.

[43] *Basic Facts*, pp. 66-67 ; *Pakistan 1953-54*, p. 81.

[44] *Basic Facts*, p. 67 ; *Pakistan's Industrial Progress*, published by Department of Advertising, Films and Publications, Government of Pakistan, Karachi, 1954, pp. 17-18; *Dawn*, Karachi, November 9, 1955, Sui Gas Supplement.

[45] *Pakistan's Industrial Progress*, p. 19 ; *Basic Facts*, pp. 49 ff.

and pharmaceutics, cigarettes, matches, sulphuric acid, D.D.T., caustic soda, machine tools, bicycles, utensils and enamelware, rubber goods, glass and articles made of glass, ceramics, telephones and telephone accessories and fertilizers ; today, most of these commodities are being successfully manufactured or factories to manufacture them are in the course of construction. Jute industry has a great future, because Pakistan is the largest grower of jute in the world, and has the monopoly of the best qualities. By the end of 1954, eleven mills with 6250 looms were in production. As they are equipped with the latest machinery, their products are excellent and are greatly in demand in the international market. Their capacity is being rapidly increased to achieve a target of fifteen thousand looms within the next four or five years.

In 1947, Pakistan produced only forty thousand tons of sugar per annum ; today, the output is one hundred and ten thousand tons ; by the end of 1957, the output is expected to be two hundred thousand tons. There has been a similar record of progress in various other industries ; for instance, there are more tanneries, vegetable oil and hydrogenated oil mills, cement factories, iron and steel mills, and industries for light engineering and for making cutlery, surgical instruments, sporting goods, diesel engines, centrifugal pumps, oil expellers, and various items too numerous to be mentioned.

The most spectacular development has taken place in cotton textiles ; from one hundred and forty thousand spindles and three thousand looms in 1947, by the beginning of 1954, the number rose to 845,576 spindles and 13,606 looms with a production of forty thousand bales of four hundred pounds each ; towards the end of 1955, the capacity increased to one million bales of one thousand and five hundred yards each [46]. When the initial difficulties of lack of capital, experience and technical personnel are taken into account, this is not a bad record of achievement and progress. Besides, in the first two or three years capital goods were in scant supply in the markets of the world. All this has been done in a poor country which had a backward agricultural economy with a low standard of living. The large sums of money spent upon the development of industry, along with unprecedented expenditure on organizing a defense force on account of the country's exposure to danger and on improving the irrigation facilities, naturally led to inflation and caused great hardship to the people, in particular to the poorer sections of the population ; but, inspired by a high sense of patriotism, they bore them with fortitute and dignity because they were proud of building up their country.

A notable feature of this industrial progress has been the part played by the Pakistan Industrial Development Corporation, which is a statutory body established by an act of the federal legislature, in January 1952.

[46] *Pakistan's Industrial Progress*, pp. 17-40 ; *Basic Facts*, pp. 67-68.

Its main contribution has been to venture into those fields of industrial enterprise where private capital is shy because of lack of knowledge, but which are nevertheless considered feasible and necessary for the economic development of the country. When such an industry is established and begins to yield profits, or when its soundness has been demonstrated to the public, its stocks are sold to the private investors ; however, care is taken to prevent the initial cornering of stocks by small groups and the small investor is encouraged. Its success has inspired the establishment of similar corporations for other purposes as well ; for example, the House Building Finance Corporation, the Cottage Industries Development Corporation, the Agricultural Development Corporation, and the Refugees Rehabilitation Finance Corporation have all tried to help in building up the economy of the country with varying measures of success [47].

Whereas the correction of a lopsided economy by creating industries and improving agriculture have been given prominence, other aspects of developing the people's potentialities have not been neglected. A most significant step has been the Village Agricultural and Industrial Development Program, which, in spite of its cumbersome and somewhat misleading name, is really a project of fundamental education and community cooperation and self-help. Like similar projects in other countries, it has tremendous possibilities of releasing dormant energies of the villagers ; in Pakistan, in particular, the prospects of success are bright because the peasants are intelligent and keen upon improving their circumstances [48].

V

The greatest hindrance in the path of rapid progress may prove to be the low percentage of literacy. In accordance with the census of 1951, only about nineteen per cent of the population was literate. Since then, there has been considerable improvement in the facilities for education, but even now they are far from being adequate. The Village Agricultural and Industrial Development Program may help in removing some of this load of illiteracy, but it will have to be supplemented by the multiplication of primary and trade schools. In spite of a considerable increase in the number of schools, colleges, and universities, these are still too few for the population. When Pakistan came into existence, there were two universities functioning in the area, and a third had only recently received its charter. As the result of the great migration across the frontiers, even

[47] *Pakistan's Industrial Progress*, pp. 2 ff. ; *Basic Facts*, pp. 59 ff.

[48] Speech broadcast by Chaudhury Mohamad Ali on March 31, 1955, p. 12, *Pakistan 1953-54*, pp. 83-84.

the two older universities were in a state of chaos and had to be reorganized [49]. Today, there are four universities in West Pakistan, and two in the East. The number of medical colleges, engineering faculties or colleges and polytechnics, has increased ; and so has increased the number of schools in the country ; but all these institutions are badly overcrowded [50]. Until the economy of the country improves considerably, it will be found increasingly difficult to provide all the necessary educational facilities. If the growth of industry maintains its pace, and agricultural development succeeds in raising the standard of life of the people sufficiently to increase the national income, the problem may be solved some day, but the achievement of these results in itself demands a higher standard not only of literacy, but also of education. The nation will have to realize the magnitude of the problem and make a supreme effort to free itself from the curse of illiteracy and ignorance, and in the process may have to adopt unorthodox methods. It is difficult to find short cuts to educating a people, but, in Pakistan, sufficient effort has not been directed towards finding out methods which would keep in view the special needs of the country, in particular its economic capacity. Besides, education still tends to be too theoretical, and does not fulfill the main purposes of training either good citizens or men capable of supplying the necessary technical personnel to the growing industries of the country. The higher ranks of the technicians are composed of men who have received their training abroad. Even among these, there are not many who can build new machines or invent new ones ; the utmost they can do is to keep the imported machinery in good running order ; the number even of those who are good in using the machines in a way to achieve the highest level of production is small. The technicians at the foreman's level are not properly trained, and Pakistan industry can earn larger profits and bring greater prosperity to the country if larger facilities for training are made available. A scheme of training within industry has been inaugurated recently, but it cannot take the place of technical institutions. The quality of liberal education at the university stage, of which there is a surfeit, is, on the whole, poor ; the standards compare favorably only with the neighboring countries, but intrinsically, they leave much to be desired.

In the sphere of international affairs, Pakistan began well and earned a reputation for liberal and democratic policies ; in particular, it played a creditable role in the United Nations, where it earned sufficient good will to be elected to various important bodies. Its election to a non-permanent seat on the Security Council was a measure of the esteem she earned during such a small period of her existence. For some time,

[49] *Census of Pakistan*, 1951.
[50] *Pakistan 1953-54*, pp. 176 ff. ; *Five Years of Pakistan*, pp. 23 ff.

it was simultaneously a member of both the Security Council and the Economic and Social Council, which was a position seldom enjoyed by any nation except the "Big Five". Pakistan has served on various bodies of the United Nations. It has always taken a leading part in supporting the cause of freedom against oppression of any kind. The main plank in Pakistan's foreign policy has uniformly been to strive to make the largest contribution of which it is capable towards securing the freedom and prosperity of their fellowmen all over the world [81].

Pakistan has identified itself with the Western Powers in military matters. It has received military aid from the United States of America ; it is a member of the South East Asia Treaty Organization and a signatory to the Baghdad Pact. Unfortunately, the domestic political difficulties created unnecessarily by some selfish politicians have adversely affected Pakistan's prestige in the world, so that its capacity to evolve and run democratic institutions successfully, or even to have a stable government at home, has come to be doubted. This has naturally resulted in a setback to its prestige in the international councils, as well as in the world press. There are in reality no inherent factors of instability in the country, which has a disciplined population not desirous of any fundamental or revolutionary changes, and which has demonstrated in critical political situations, when frustration was very strong, that it is capable of resolving political problems in a calm and constitutional manner.

[81] *Five Years of Pakistan*, pp. 29 ff.

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III. DISCUSSIONS

D. OLDEROGGE

Review of « African Culture and the Western Intrusion »

by K. Little *

The article under review falls into two parts. The first is devoted to the culture of the peoples of Africa south of the Sahara towards the beginning of the 20th century, the second deals with the present-day changes taking place within the African society, which the author ascribes to the impact of " westernisation ", i. e. the emergence of a Western-type culture. The actual process, however, is the penetration into Africa of capitalist relations, causing profound changes within the African society.

Especial interest is imparted to the article—quite interesting in itself—by the factual material cited in the second part. The author, who is well known for his work devoted to the Mende people, is also familiar with the problems facing Western Africa. Migration, " urbanisation ", the development of the national movements and various forms of co-operation are all clearly traced. However, we cannot accept the use of the term " industrialisation " by Mr. Little. Following the tradition of Anglo-American sociology, he speaks of the " industrialisation " of the African colonies without making any reference to the lopsided economic development of colonies as such. Soviet historians and economists understand industrialisation as the emergence of big industrial establishments ; in the African colonies, however, only such industries are being developed as are engaged in elementary processing of exported raw materials. Industrial establishments in the colonies are built with the aim of turning them into agrarian and raw-materials producing appendages of the metropolis, of adapting its economy to the latter's needs. In the opinion of this reviewer, the lopsided character of the economic development of Africa should have been pointed out, for it is essential for understanding its present-day status. This type of " industrialisation ", far from emancipating the peoples of Africa, helps to shackle them, placing the indigenous population at the mercy of the fluctuations of the world market.

Another point should be made with regard to the treatment of the national movements. Mr. Little does not distinguish—and bring out the fundamental difference between various types of social movements : between Kimbanguism, the Descendants of Oduduwa Society, on the one hand, and organisations of the *Rassemblement Démocratique Africain* type, on the other. Moreover, he leaves out the trade unions, workers' organisations, etc., which minimises the problems of the development of modern Africa. It should also be mentioned that the article makes no reference as to the numerical strength of the working class, although this is a point of interest to any author.

There are some errors in the first section, which gives a general outline of the culture of the peoples of Africa.

1 (p. 941). Enumerating the "culture areas" of Africa, the author bases himself on the work of Professor Herskovits (U.S.A.). Yet he mistakenly refers the peoples of Western Sudan to the Eastern Sudan area. Herskovits believed Eastern Sudan to be a separate marginal area. In his classification, Eastern Sudan comes under N° 7, Western Sudan under N° 8. It is quite obvious that the Hausa, Fulbe and Yoruba peoples cannot be considered as belonging to the Eastern Sudan area.

2 (p. 941). The assertion that the African cultures "lacked the arts of reading and writing " is not correct. The author makes an exception in the case of Abyssinia, and also admits the existence of " some local literacy in Arabic ". Mention should have

* *Journal of World History*, III, 4 (1957), pp. 941-964.

been made of the Baya writing, a phonetical study of which was made by Klingenheben, the Nsibidi and Bamum writing, the West-African systems of counting symbols, etc. Along with these elementary writing systems there were those based on Arabic characters. Like the Turks, Persians and other peoples of the Near East who based their writing systems on Arabic characters, supplementing them with new ones and punctuation signs, some of the African peoples (the Hausa, Fulbe, Kanuri and Swahili) adapted Arabic writing to their own languages. Thus, the Hausa invented a new sign —the underline dot—to denote the E sound, used the Arabic kaf to denote the ordinary, and the Arabic koph the emphatic, K sound which was lacking in Arabic ; the long O was conveyed through combining the alif and waw, etc. In short, they created their own writing systems in a way similar to that of the people of Europe, who borrowed the Latin and Greek alphabets—and before that the Old Phoenician alphabet. To ignore this fact is to underrate the cultural development of the peoples of Africa.

3 (p. 942). While speaking of the abstract, expressive content of African art, the author forgets the realistic figurines and heads found by Frobenius, and other researchers after him, in Ife and elsewhere in Southern Nigeria.

4 (p. 942). In this enumeration of the medieval states of Western Sudan Mr. Little has left out Bornu and the cities of Haus.

5 (p. 943). We do not agree with Mr. Little that the economic activities of the primitive society were organised on the basis of the " elementary family ". These " families " were a part of the clan lineage. While advancing these general statements, the author makes no mention of the clans although he speaks of the mutual aid among kinsfolk and affinal relatives.

6 (p. 943). The development of trade in Africa followed a pattern different from the one conceived by the author. It can be deduced from the article that, barring Western Sudan with its trans-Saharan commerce, the prevailing form was gift exchange as a part-economic, part-ceremonial transaction. W. Fröhlich, in his work on the African markets (1941), showed that there were markets throughout the Congo, Upper Guinea and Western Sudan ; the three- or four-day " weeks " were set down on the basis of the alternation of market days ; in many areas there were systems of monetary units, etc. In short, trade relations in Africa were developed far better than Mr. Little gives them credit for.

7 (p.944). While describing the matrilineal extended family it has to be noted, for accuracy's sake, that the husbands were not members of that family. Mr. Little himself points out that membership in such groups was determined by birth. I can also cite the works of Belgian ethnographers who studied the family structure in the Western Congo area.

8 (p. 945-946). The author's choice of the Yăko as a typical instance of the clan system is not a happy one. The Yăko, of whom Daryll Forde made an excellent study, are interesting for the complicated combination of two systems of establishing kinship. Perhaps it would have better answered the purpose if another society, with a less complicated structure, had been considered. What actually happened is that Mr. Little has considered only the patrilineal Yăko relationships, omitting all matrilineal institutions.

9 (p. 951). We cannot agree that Islam was thrust on the peoples of Western Sudan by military conquest, which, allegedly, " superimposed " a ruling class on the indigenous population. A study of the history of Western Sudan will show that the native rulers mostly adopted Islam of their own will. This consolidated their position, tended to promote trade with the Moslem merchants and the North ; in the Moslem clergy the rulers found support for their struggle against the ancient cults and their priests. In other words, adopting Islam was a progressive factor, consolidating as it did the new, feudal relations in primitive society. Through Islam the rulers and their retinue came into contact with a higher type of culture, etc. The process of the spread of Islam in Africa was of a most complicated nature ; describing it as being effected by force of arms narrows the issue and misrepresents the history of the spread of that religion.

Dr K. LITTLE'S ANSWER

Professor Olderogge approves my presentation of the contemporary social trend, but takes me somewhat severely to task for not pointing out "the lopsided character of the economic development" of Africa. I must confess that I do not see what the latter has got to do with a scientific study of African history. I was asked to write about the effects of the Western intrusion upon traditional culture, and the question of whether Africans would be more "emancipated" had they undergone a Soviet form of industrialization is a matter for speculation as well as being beside the point. The only conclusion is that Professor Olderogge thinks it possible to evaluate social systems, because, later on, he falls into the same trap by characterizing Islam as "a higher type of culture" than primitive society. It was because I was mainly concerned with the 'adaptation' of traditional institutions, that (as I explain on page 956) I omitted consideration of trade unions. The latter as well as the modern organization of government, Mission churches, etc. are primarily the result of European initiative. I agree, of course, that there is a difference between the Descendants of Oduduwa Society and organizations of the *Rassemblement Démocratique Africain* type. In fact, I mentioned that the former society is a Yoruba cultural association, and my paragraphs discussing Action Group and Kimbanguism were not only headed *Nationalism and Nativism*, but pointed out the difference between modern political parties and the latter type of movement. I did not attempt to estimate the size of the "working class", because, even if we limit it to people labouring in mines, on plantations, etc., many of these "workers" also have land of their own to which they frequently return to grow marketable crops, sometimes employing other "workers" for the purpose.

I apologise for the slip of my pen which resulted in Bornu, Hausa, etc. being classified culturally as "Eastern Sudan". I must also admit my omission of a number of elementary writing systems, although the main point of my observation in this regard was the absence of written records from indigenous cultures. Possibly Professor Olderogge has under-estimated the difficulties of compression in some of my other "errors" because in regard to (4) I was not attempting to enumerate, but simply to exemplify my reference to the "historic cities and empires of the Western Sudan". Similar considerations of space impelled me to limit my remarks about art (3) to forms in which Africans have seemingly excelled. In regard to (9), I prefaced my brief remarks about the spread of Islam with a reference to trade and migration as well as invasion, but have admittedly overemphasised the part played by force of arms in this matter.

Professor Olderogge's remaining criticisms, I feel, have less basis. For exampie, had he referred me in (5) to the extended family, I would have been prepared to take his point; but I find it difficult to follow his implication that clans provide the organisational basis for economic activities, such as agriculture. Clans often own land and have important political and religious functions; but I have yet to learn that it is common for a clan to turn out as a group to hoe fields, lift groundnut crops, etc. This is quite apart from the fact that clanship is by no means universal and that many clans are dispersed, i.e. non-local from the point of view of residence. In (6) my remarks again suffer from compression, but their main point is that indigenous forms of commerce were rarely well developed except in West Africa—a suggestion which Professor Olderogge's quotation from Fröhlich tends, if anything, to support. He raises rather a fine point in (7), but I admit that my wording would have been less ambiguous had I referred to the matrilineal extended family as "a domestic group consisting of a woman and her husband, etc., etc." Finally, I agree that a less complicated structure than that of the Yako would be better for purposes of illustration, but I used this people mainly for exemplifying marriage and family life rather than kinship.

A. I. BLIAKHER et S. L. SOBOL

Remarques sur l'article du Prof. Jean Rostand " LA BIOLOGIE AU XIX^e SIECLE " *

Cet article donne une juste représentation du développement de la biologie au XIX^e siècle. Cependant, il est certains points sur lesquels il est impossible d'être en accord avec l'auteur.

Page 709. Il est erroné d'affirmer, comme le fait l'auteur, que Schwann aurait « étendu » la notion de la cellule au règne animal. La théorie de la cellule consiste en ce que la cellule est considérée comme la base unique élémentaire de la structure initiale tant des plantes que des animaux. Avant Schwann, cette théorie n'existait pas. C'est justement lui qui l'a créée.

Page 710. Parlant de la division de la cellule, l'auteur rappelle seulement les noms de Strasburger et de Flemming. Cependant, il est maintenant généralement admis que leurs prédécesseurs furent Tchistiakov et Pérémejko, dont les travaux furent connus de Strasburger et Flemming.

Page 710. L'auteur écrit que la double fécondation fut découverte par Guignard et Navaschine. En réalité la double fécondation fut découverte par l'académicien russe Navaschine.

Page 711. Les préformistes des deux tendances, ovistes et animalculistes, finirent d'exister au XVIII^e siècle. A la fin du XVIII^e siècle, ou en tout cas dans la première décade du XIX^e, après les travaux de K. F. Wolff, personne ne prenait déjà plus au sérieux les préformistes.

Page 717. L'auteur ne donne pas une détermination précise des notions de « sélection naturelle » et « artificielle ». Cela est pourtant nécessaire, autrement l'exposition de la théorie de Darwin reste insuffisante.

Page 717. L'auteur estime que la reproduction dans les mondes animal et végétal se produit « conformément au principe de l'économiste Malthus ». Ceci n'est certes pas juste. Un tel exposé du darwinisme ne fait que reprendre certaines thèses erronées émises par Darwin, bien qu'en réalité cela ne touche pas au fond même de sa théorie.

Page 718. L'auteur ne dit rien de la plus importante thèse de Darwin sur la variabilité indéterminée et sur le rôle créateur de la sélection, transformant la variabilité non dirigée en un processus dirigé d'évolution. D'après nous, ces positions doivent être développées et expliquées dans l'article.

Page 721. Il nous semble qu'il serait mieux de dire « formation de la personnalité physique et intellectuelle » au lieu de « physique et morale ». Dans cette même page, il serait mieux, d'après nous, de supprimer tout ce qui est dit sur l'eugénique.

Lettre de M. Jean ROSTAND
au Secrétaire général de la *Commission Internationale* (17 mai 1958)

Cher Monsieur,

Je vous renvoie ci-joint les remarques faites par les Professeurs Bliakher et Sobol au sujet de mon article sur *La Biologie au XIX^e siècle.*

Il est évidemment impossible de tout dire en quelques pages, et, surtout, de satisfaire tout le monde.

Je me bornerai à contester (page 711) que les préformistes aient disparu au XVIII^e siècle. Les travaux de Wolff ont d'abord été discutés et, par exemple, le célèbre physiologiste *Lazare Spallanzani* (vers 1780) se montre encore résolument préformiste.

Même au début du XIX^e siècle, l'idée préformiste persiste, sous une forme à peine atténuée. Cf. *Virey*, qui écrit (article *Génération*, dans le *Nouveau Dictionnaire d'histoire naturelle*, 1817) :

« Un œuf de grenouille, ou de poule, non fécondé, contiennent déjà tous les linéaments de l'animal qui doit en naître. Spallanzani a vu, au microscope, le jeune têtard dans celui de la grenouille ; Haller a remarqué, dans l'œuf de la poule, la membrane du jaune qui doit servir à la formation du poulet. Que manque-t-il donc à ces jeunes êtres ? L'excitation vitale du père. »

Veuillez agréer, etc...

* *Cahiers d'Histoire Mondiale*, IV, 3 (1958), pp. 709-722.

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